VOL. XXXVI. No. 11 NOVEMBER 1951

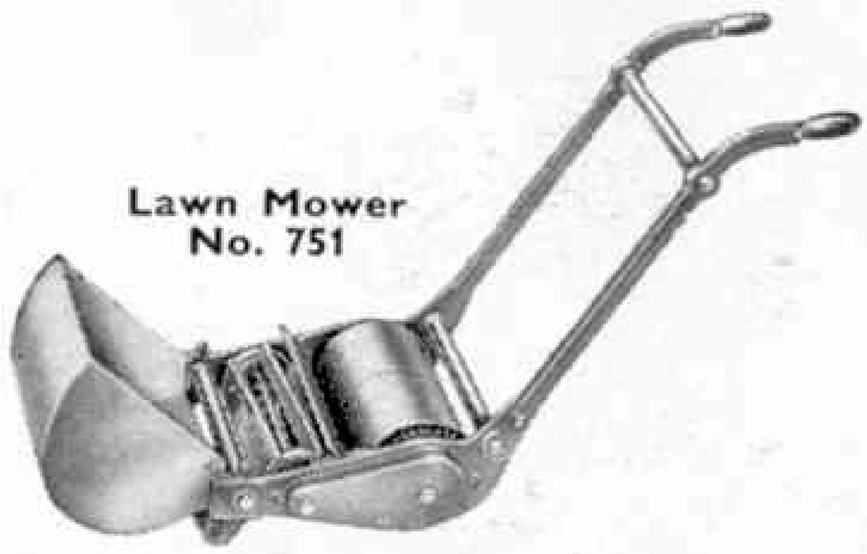
MECCANO MAGAZINE

NEWCASTLE – BRISTOL EXPRESS

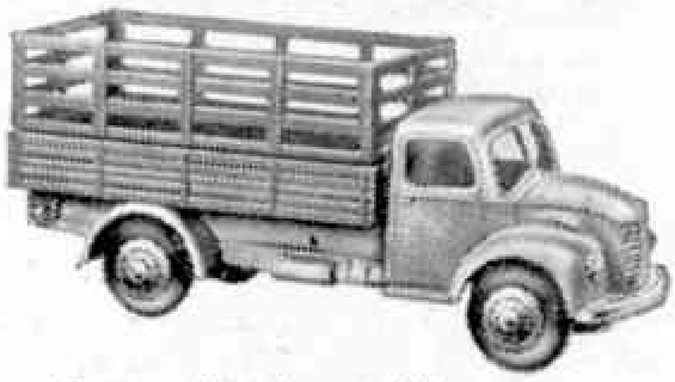
9D.

DINKY TOYS

Guy Van
No. 514

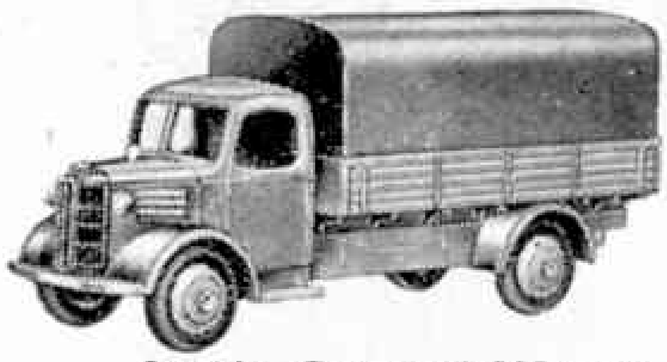


Lawn Mower
No. 751



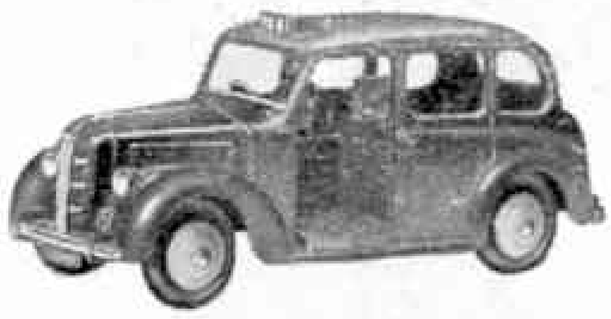
Farm Produce Wagon
No. 30n

Estate Car
No. 27f



Austin Covered Wagon
No. 30s

Morris Oxford Saloon
No. 40g

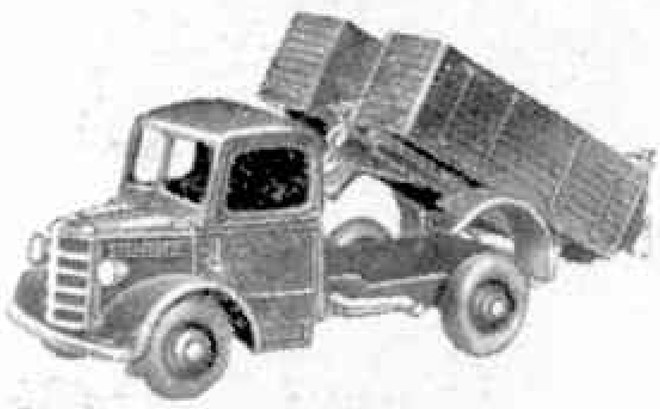


Austin Taxi
No. 40h

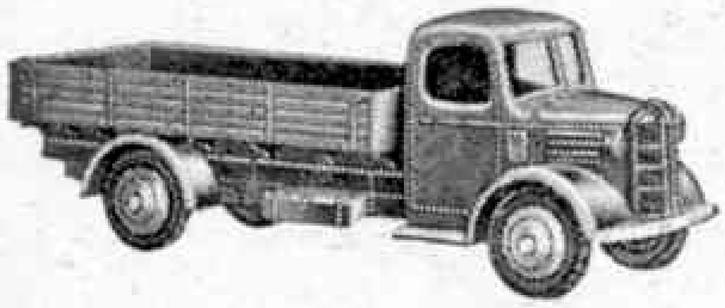
Breakdown Lorry
No. 25x

Daimler Ambulance
No. 30h

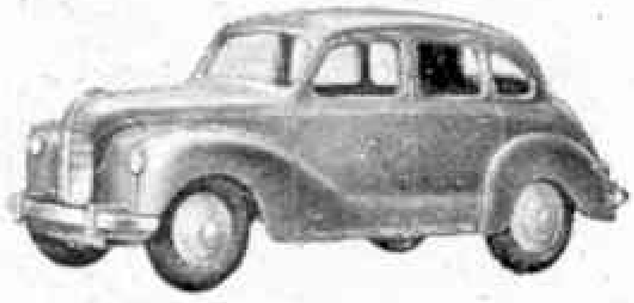
Bedford Truck
No. 25w



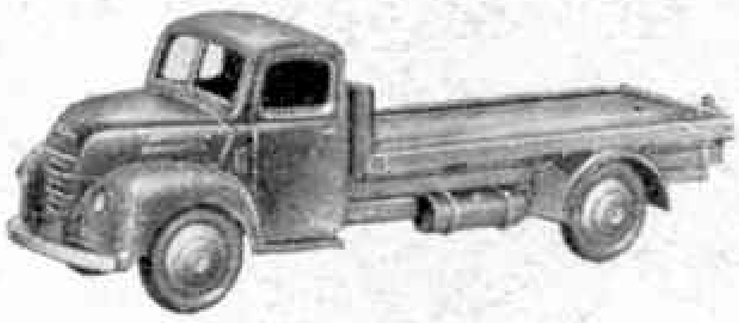
Bedford End Tipper
No. 25m



Austin Wagon
No. 30j



Austin "Devon" Saloon
No. 40d



Fordson "Thames" Flat Truck
No. 30r

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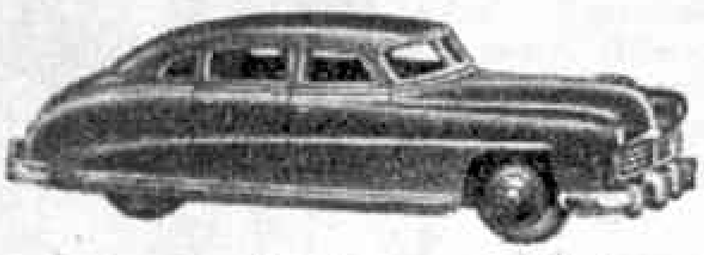
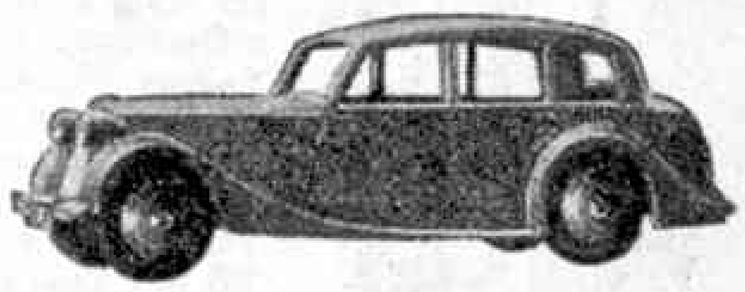
DINKY TOYS

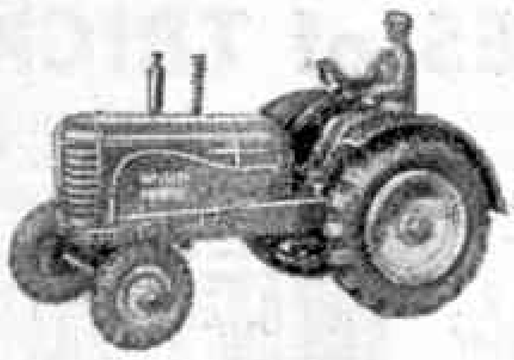


Hudson
"Commodore" Sedan
No. 139b

Land Rover
No. 27d

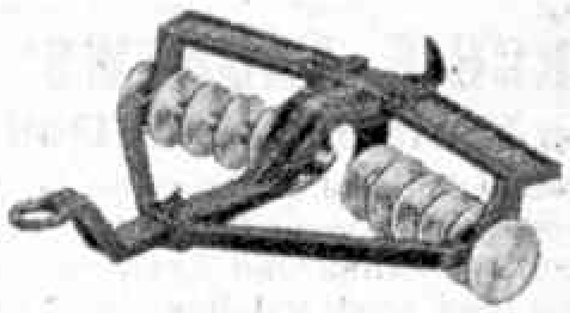


Triumph '1800' Saloon
No. 40b



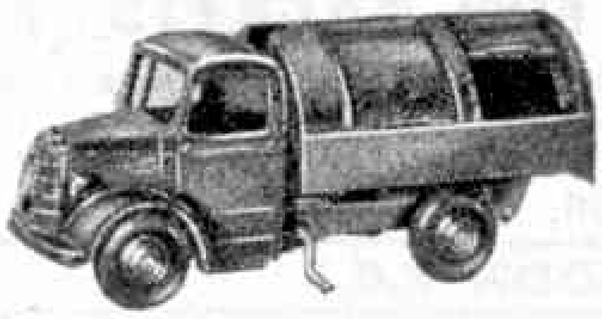
Massey-Harris Tractor
No. 27a

Harvest Trailer
No. 27b

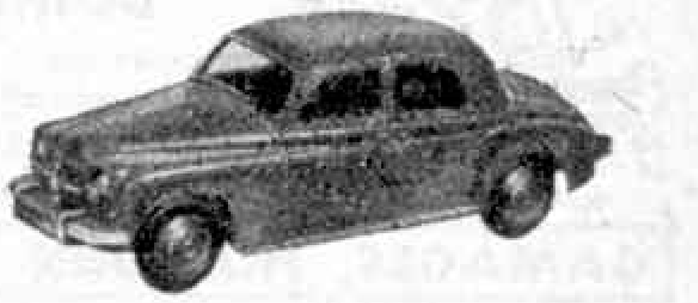


Disc-Harrow
No. 27h

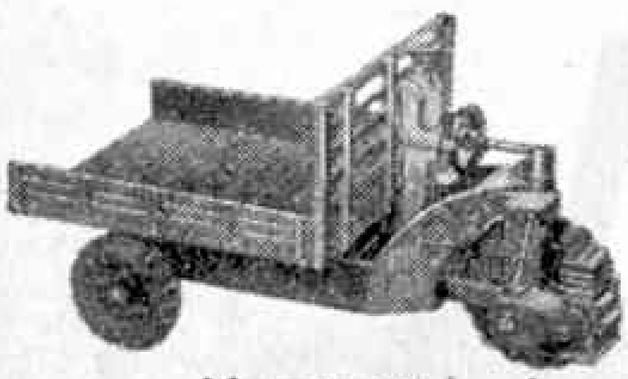
Ford "Fordor" Sedan
No. 139a



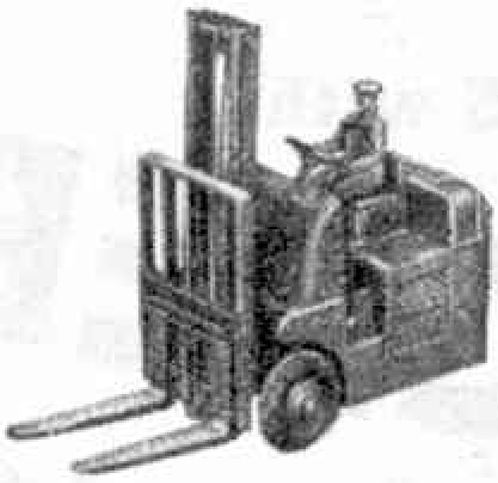
Refuse Wagon
No. 25v



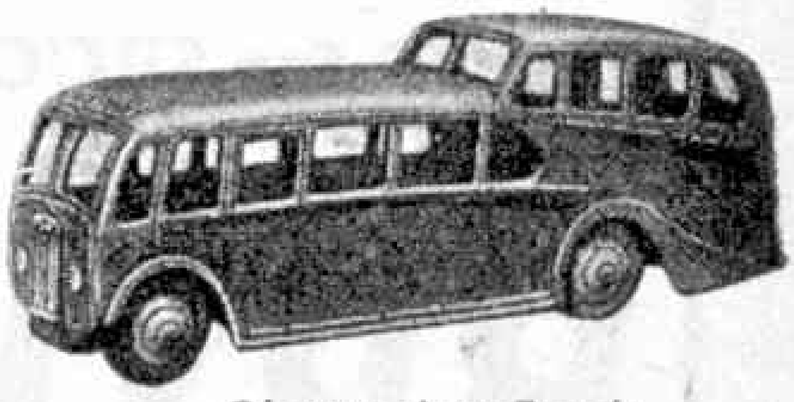
Rover 75 Saloon
No. 140b



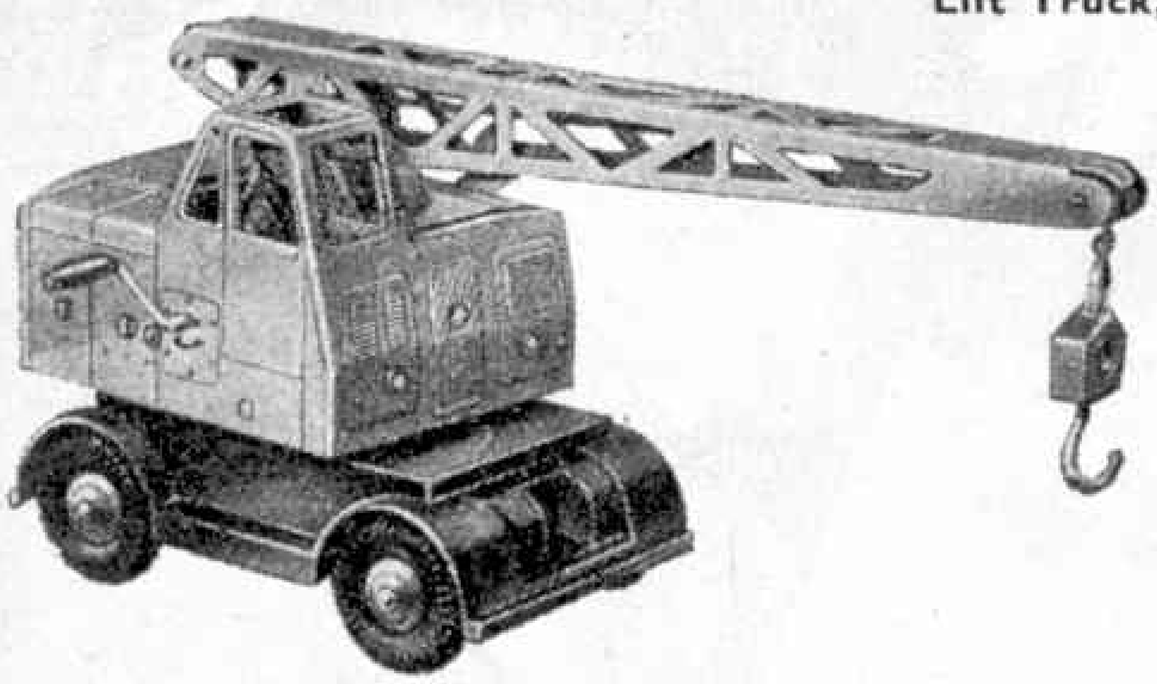
Motorcart
No. 27g



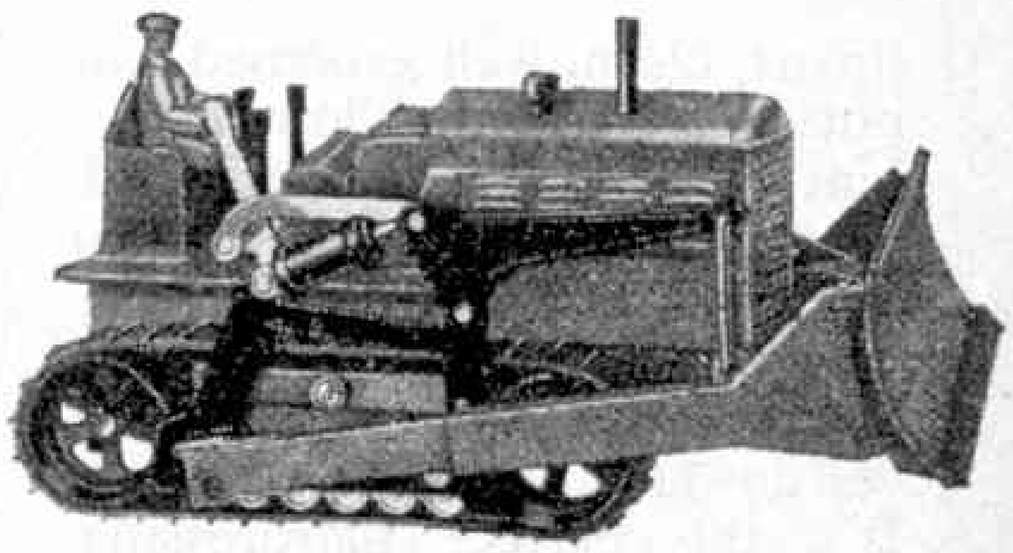
Coventry Climax Fork
Lift Truck, No. 14c



Observation Coach
No. 29f



Coles Mobile Crane
No. 571



Blaw Knox Bulldozer
No. 561

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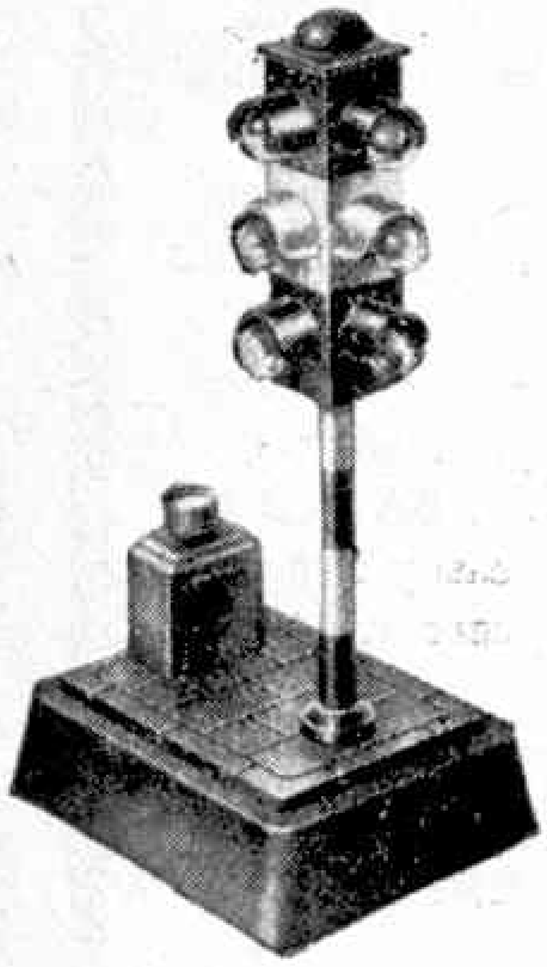

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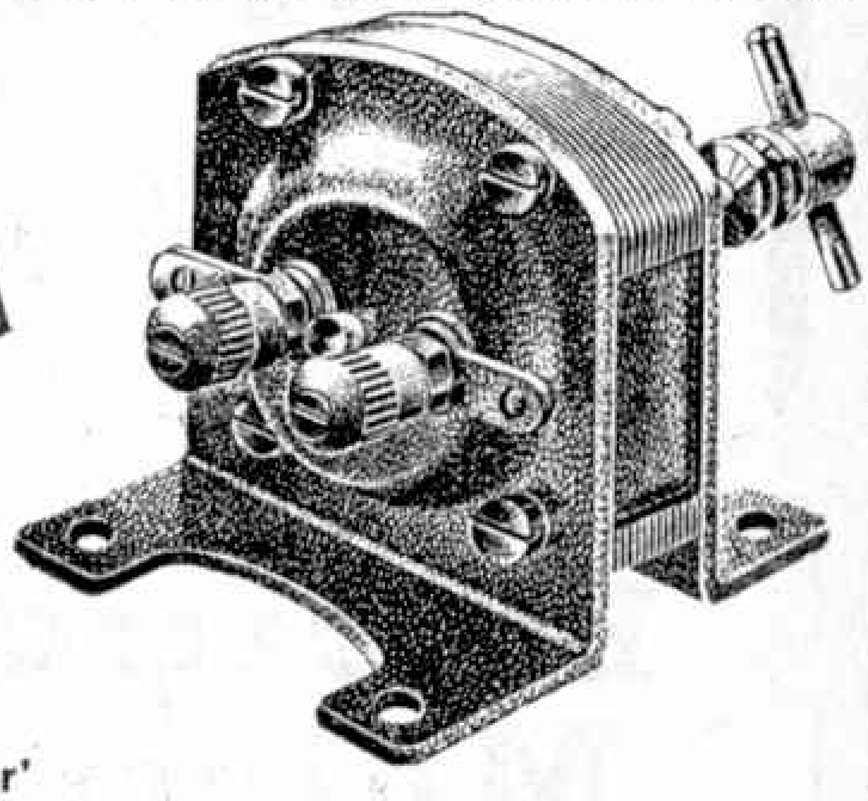

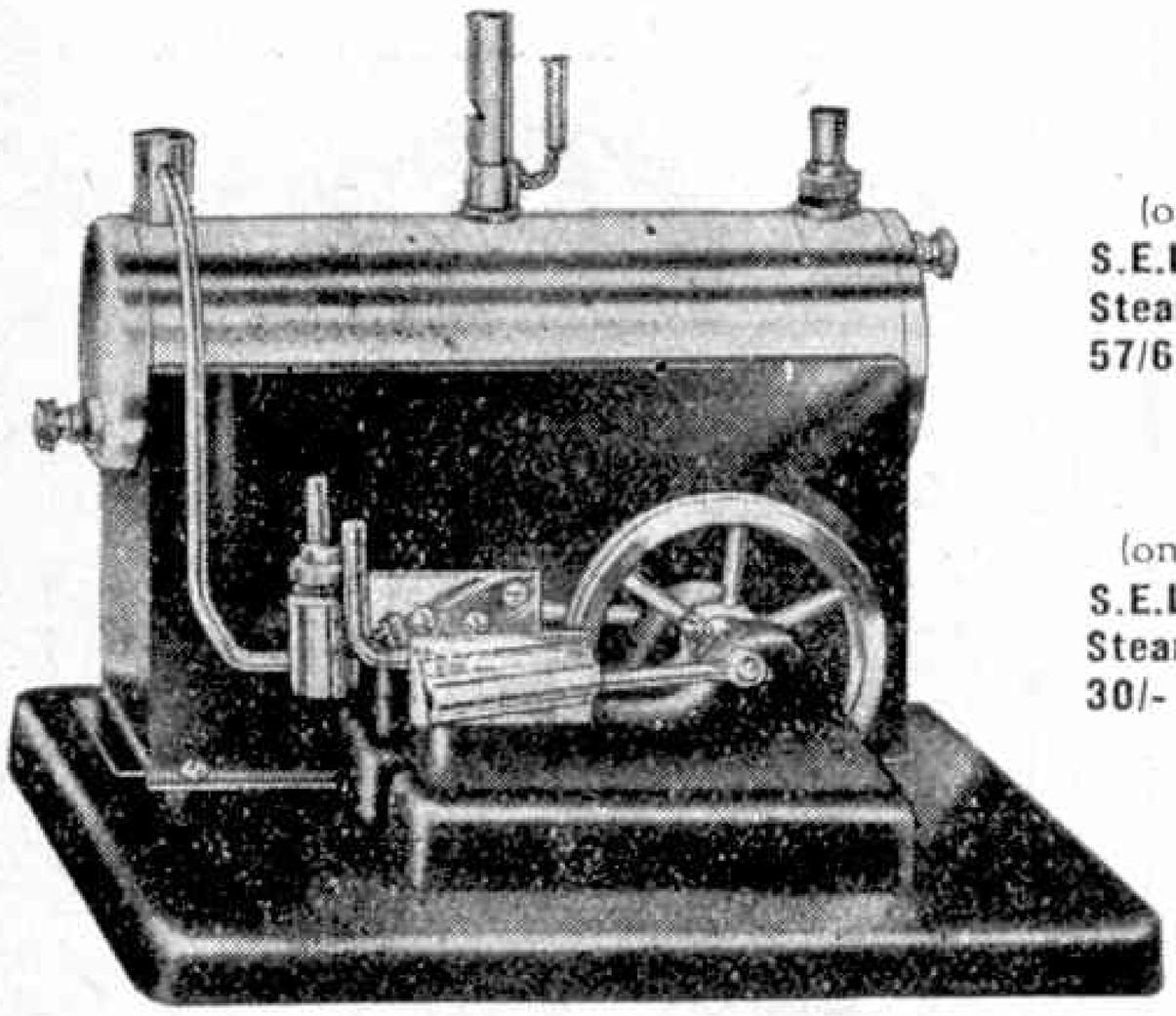

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(on right)
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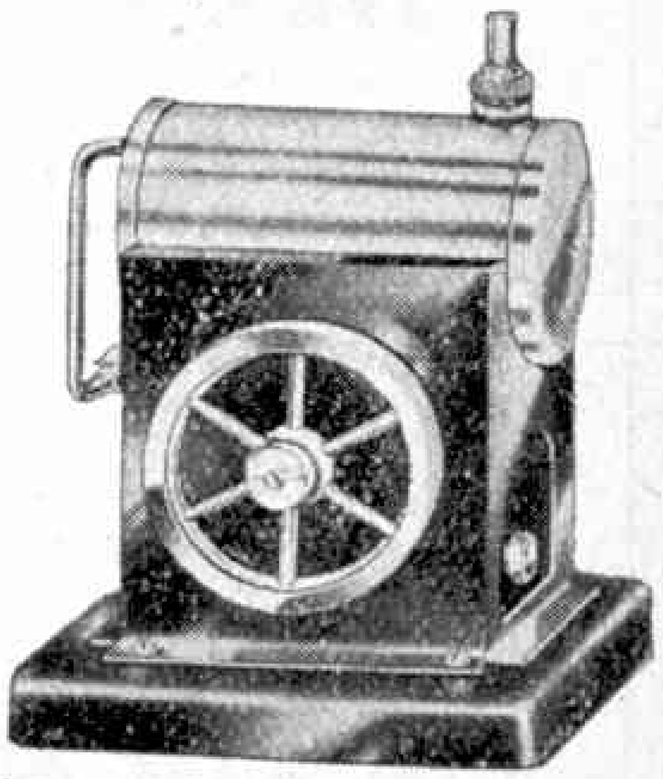

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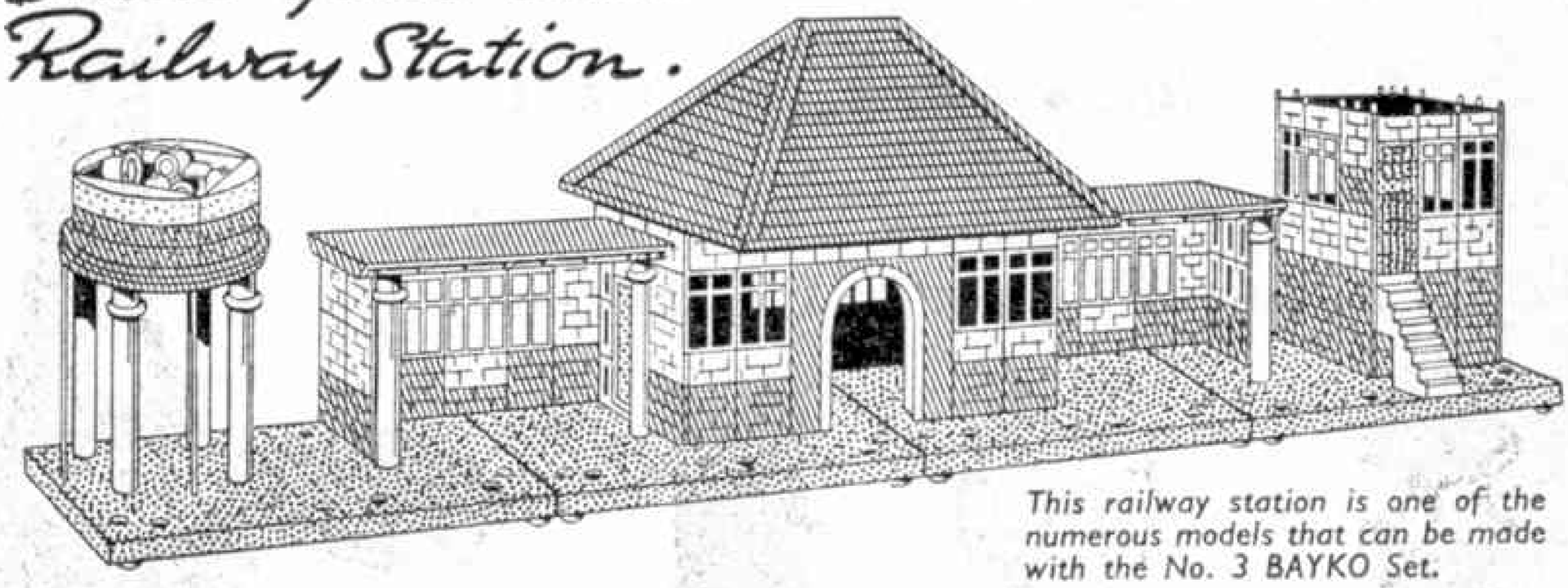

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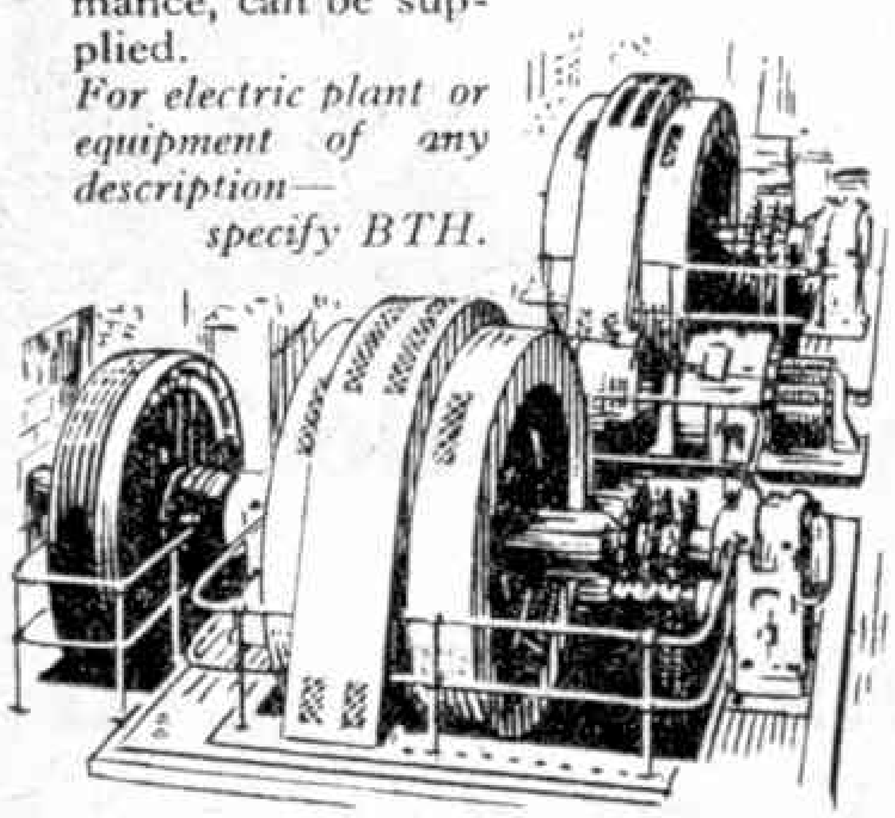

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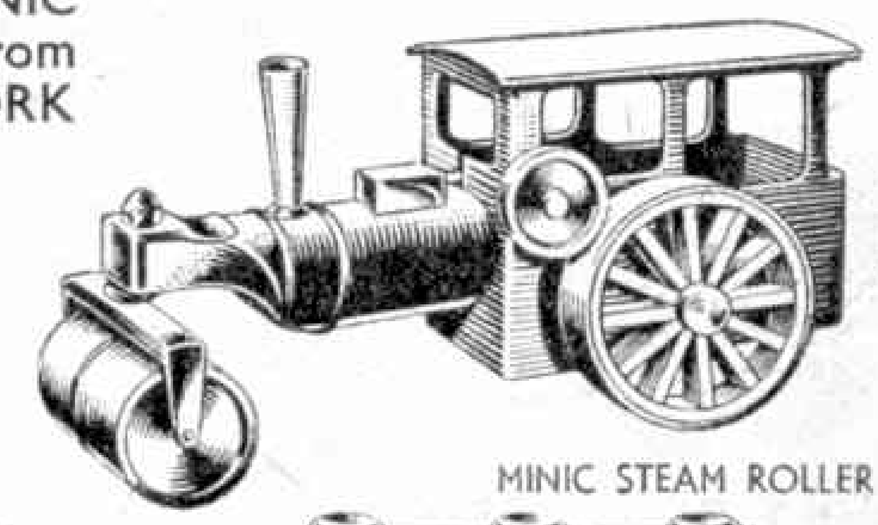

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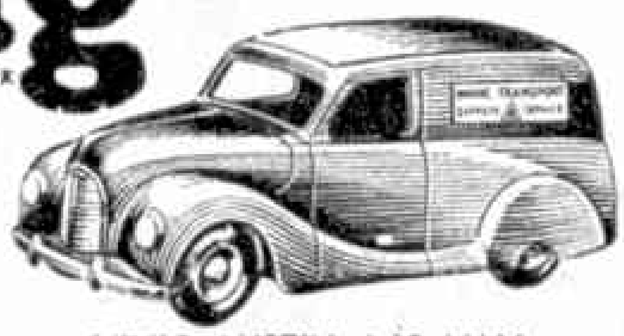
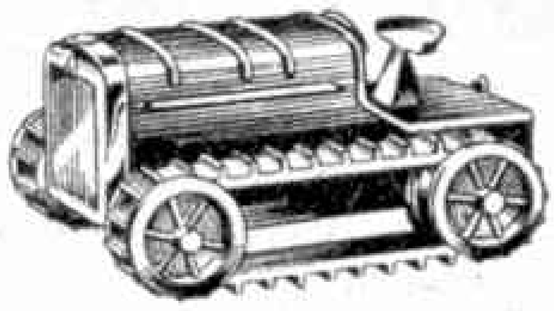


MINIC AUSTIN A40 VAN



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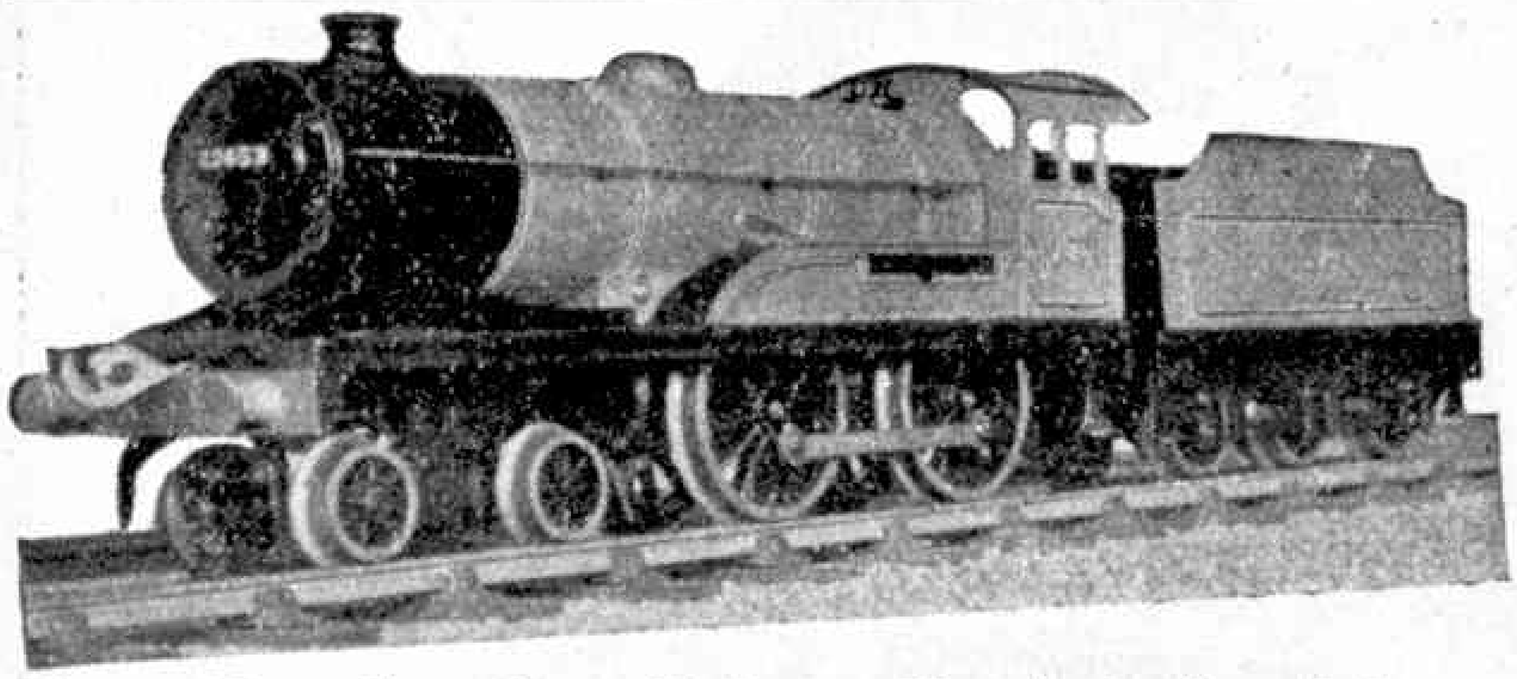

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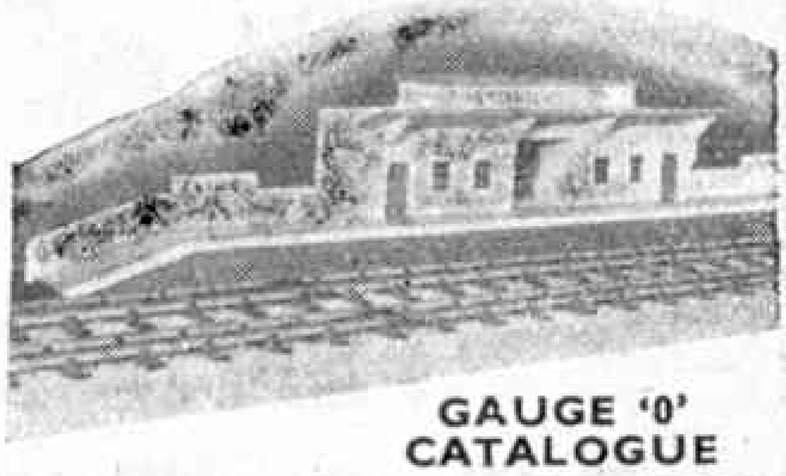

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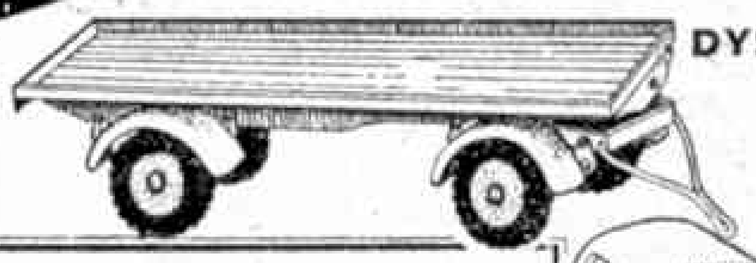
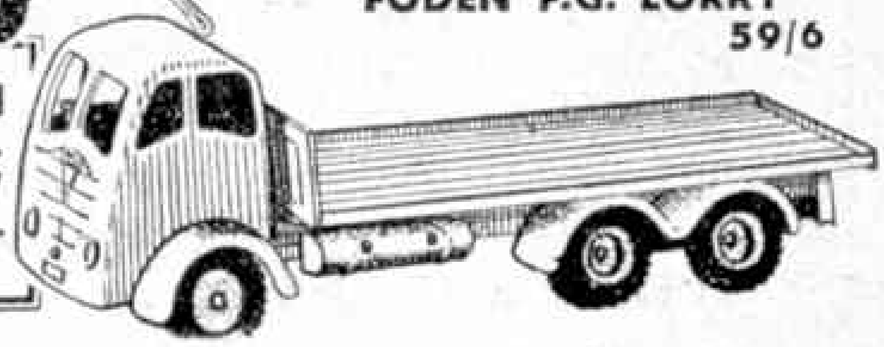


DYSON 8 TON TRAILER 18/6

FODEN F.G. LORRY 59/6



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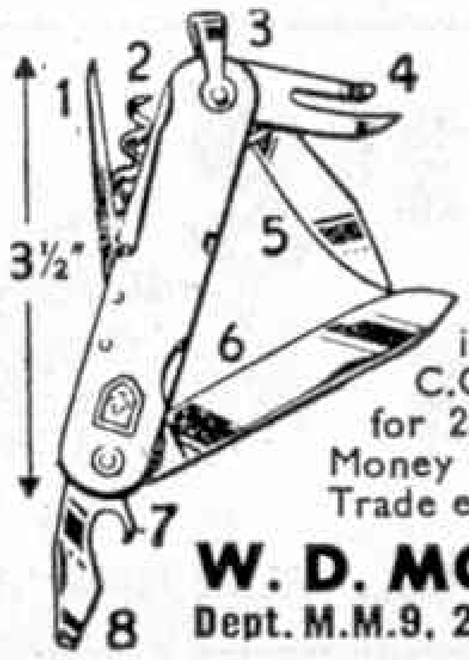

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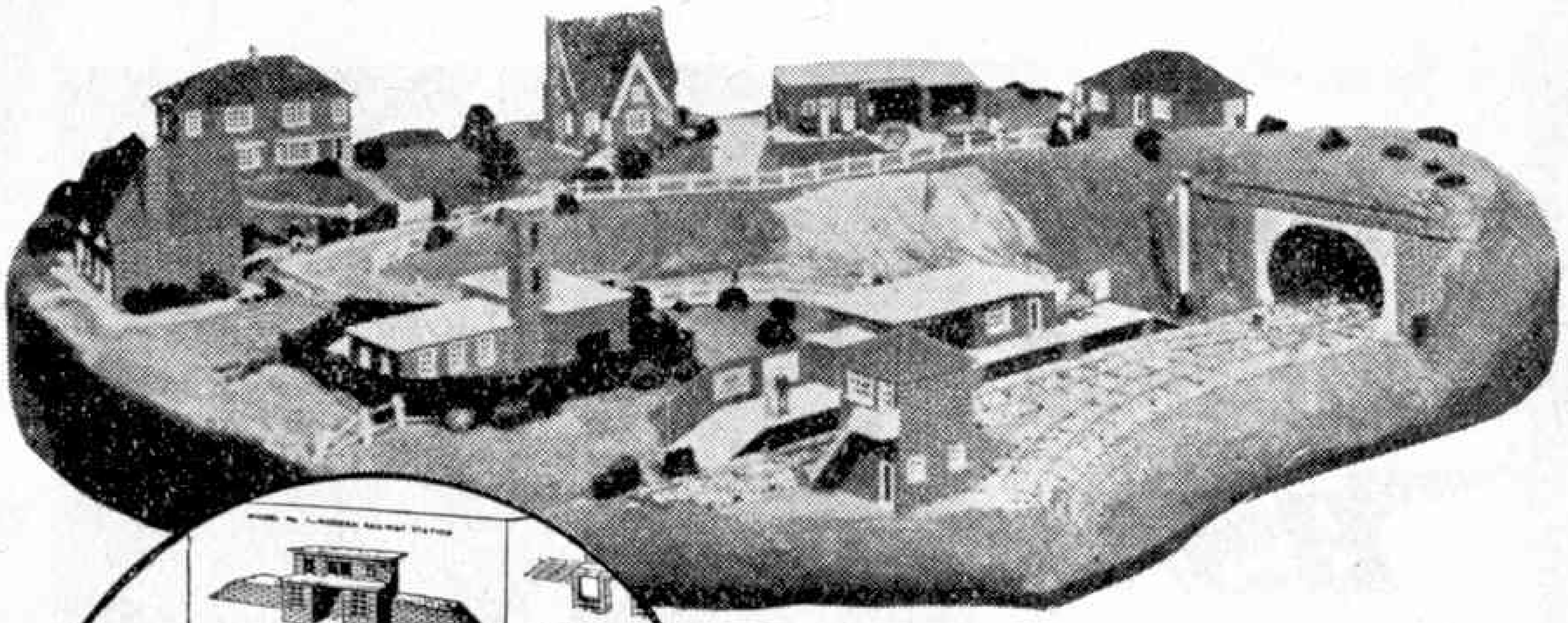

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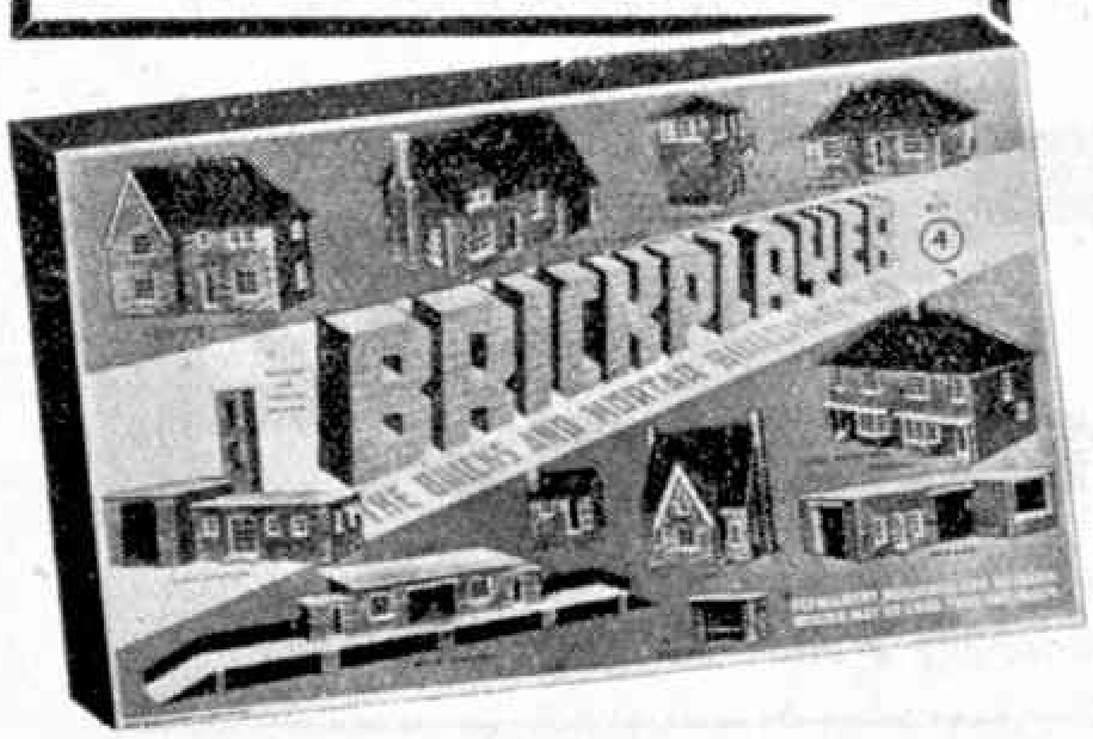

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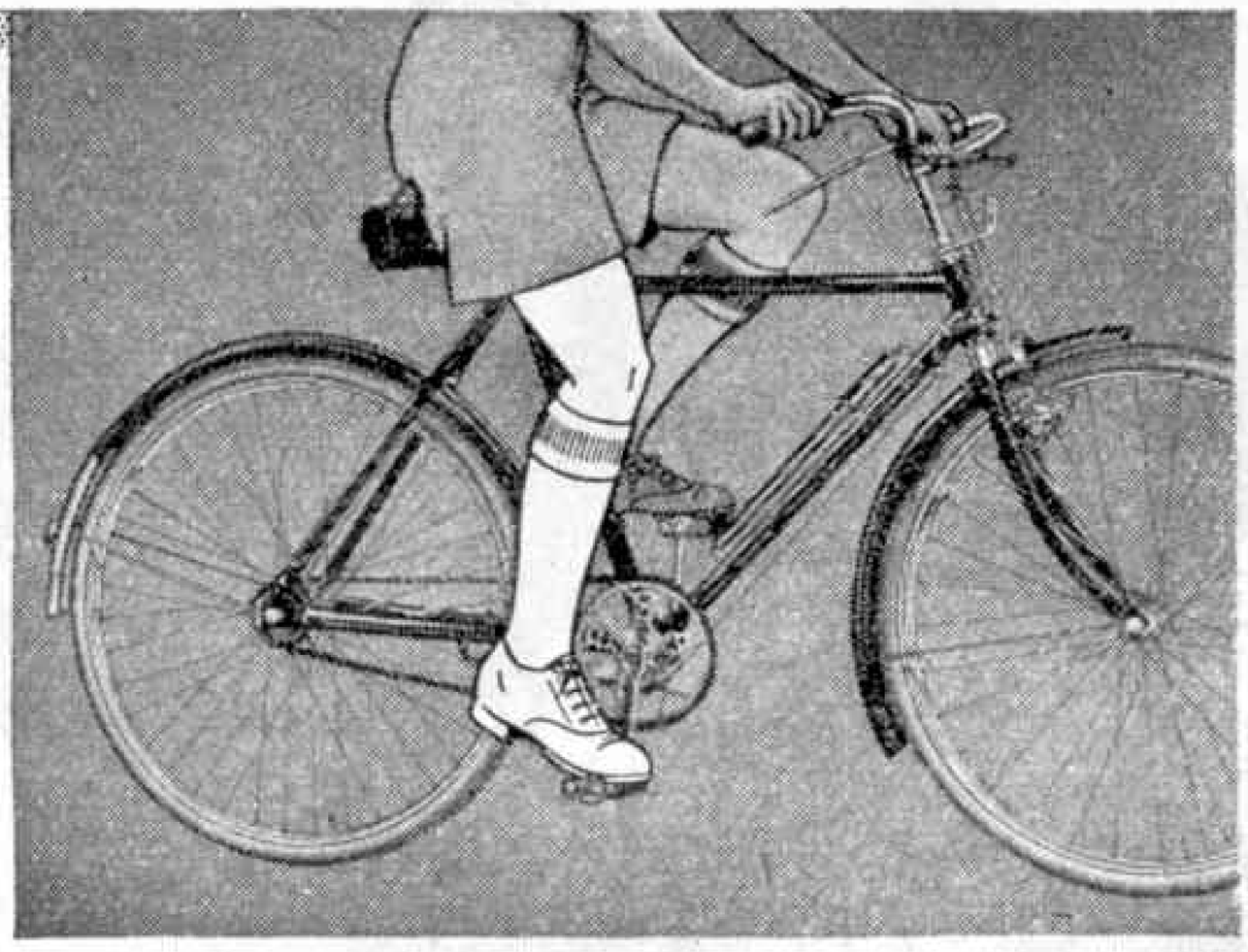

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MECCANO MAGAZINE

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With the Editor

A Railway "Housewives' Choice"

Those of us who live in a city or town, where there are perhaps two or more main line stations and several suburban ones within fairly handy reach, are apt to take such things for granted. In more remote parts the railway station becomes a centre of greater local significance.

This thought occurred to me when reading in the *"British Railways Magazine"* recently about Dalnaspidal, 1,404 ft. above sea level and the highest main line station in Great Britain. Many trains pass this bleak and remote spot, but few stop. It is on the line from Perth to Inverness, just about a mile south of Druimuachdar summit, and trains over a certain weight are assisted up the difficult 18-mile climb from Blair Atholl, which includes over six miles at 1 in 70. The assistant engines come off at the summit so that the station is an important operating point.

There are no shops at Dalnaspidal, which is simply a cluster of railwaymen's houses lying close to the line. To serve the needs of these men and their families here and elsewhere along the line, a train leaves Blair Atholl every other Saturday for Kingussie, and its purpose is neatly summarised by its nick-name, *"Housewives' Choice."* It calls at all cottages on the way, taking the families of railwaymen to and from Kingussie to buy their household requirements. Some of the points at which it calls have names of ill-omen when snow is about, such as Black Tank and County March for instance. In fact in this exposed locality the railwaymen often have to dig themselves out of their houses to go on duty and then have to dig themselves in on their return.

Other stations too have their peculiarities. One of these is Troutbeck, between Penrith and Keswick, where the waiting room possesses a harmonium. On Sundays the station is shut and the waiting room becomes a Sunday School. Garsdale station in Yorkshire, on the Leeds-Carlisle main line, has a library, and at Hest Bank, on the West Coast main line, there is a windmill.

* * * *

Our cover this month, showing a Newcastle-Bristol express leaving Derby behind 4–6–0 No. 45690 *"Leander"* is based on a photograph by Mr. T. Lakin, of the London Midland staff at Derby.

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Ship Surgery

By Morrys Rodney

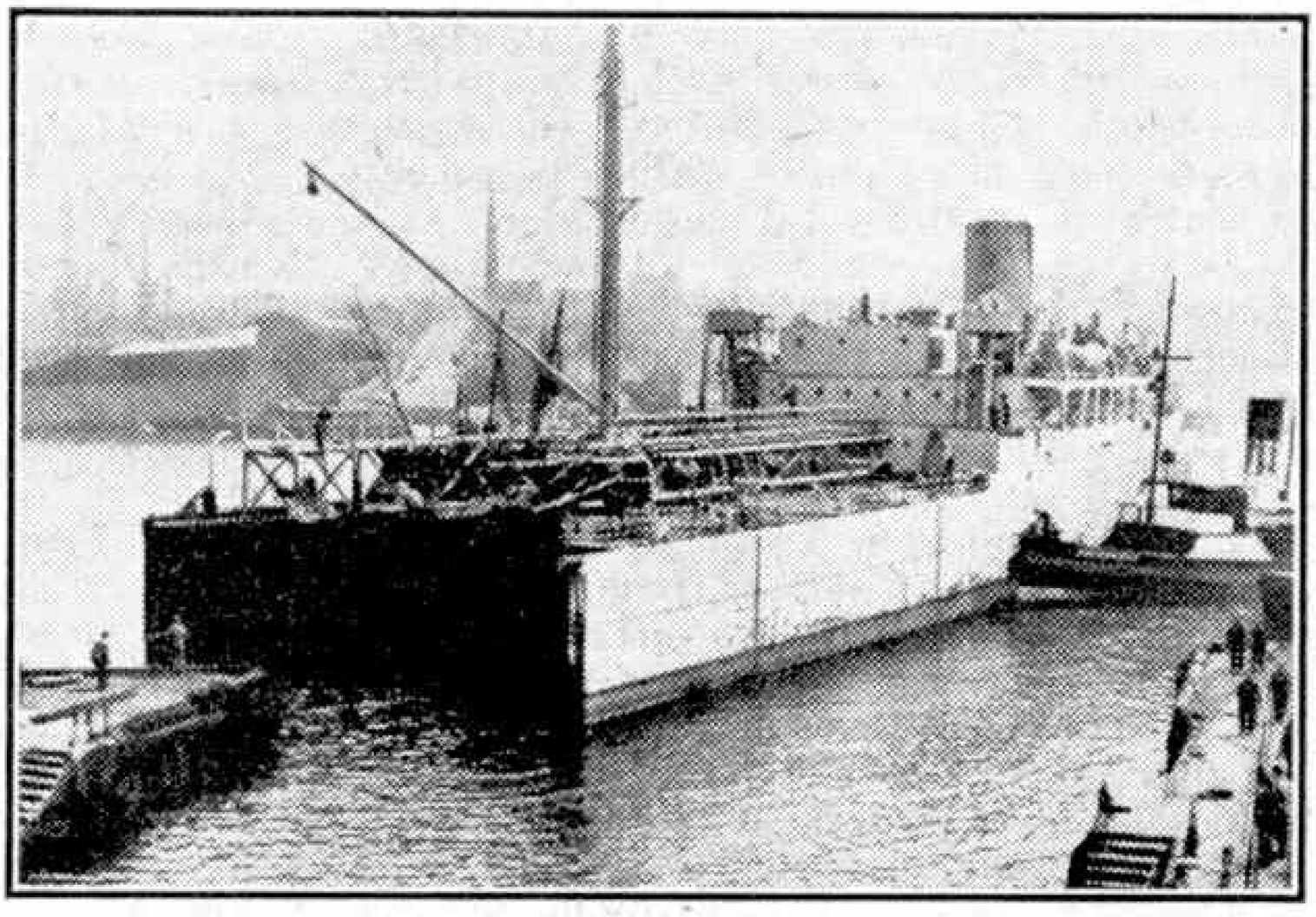
THE demand for ships is so great nowadays that British shipyards find it difficult to keep pace with orders. The rearmament programme has not only filled the slipways with men-of-war; it has also brought employment of merchant ships in moving the cargoes of emergency stocks now being built up. Tonnage now in service has increased considerably in value. Owners who secured new ships after the war are reaping the benefit of their foresight, but even old tonnage is worth a fortune. Although some of the veterans are obsolete by modern standards, their hulls are still sound enough to merit internal reconstruction.

In normal times no shipowner would go to any great expense in having an old vessel reconstructed. In the case of liners, a period of 20 years generally finds them moving to the scrappers; it is then more economic to have them broken up and replaced by a new ship, up to date in every way. But with prices at their present level, and a very long interval before a new ship can even be started, it is necessary to keep existing vessels alive as long as possible.

The amount of work required in these ships may vary considerably, some being so well maintained each year that a moderate outlay will bring them right up to date. It is generally in the machinery that signs of age appear, with breakdowns causing expensive delays between voyages. Provided the fabric of the ship is in good condition, new engines give her a fresh lease of life.

It often happens that the fitting of new machinery is accompanied by improvements to the hull. With an old vessel a complete reconstruction is out of the question, for that would cost nearly as much as a new ship. The most that can be done is to rebuild the bow on finer lines giving less resistance, thus needing less power to push the hull through the water at the same speed. If the machinery has the same horse power as the old installation, one can expect a higher speed on the same outlay in fuel.

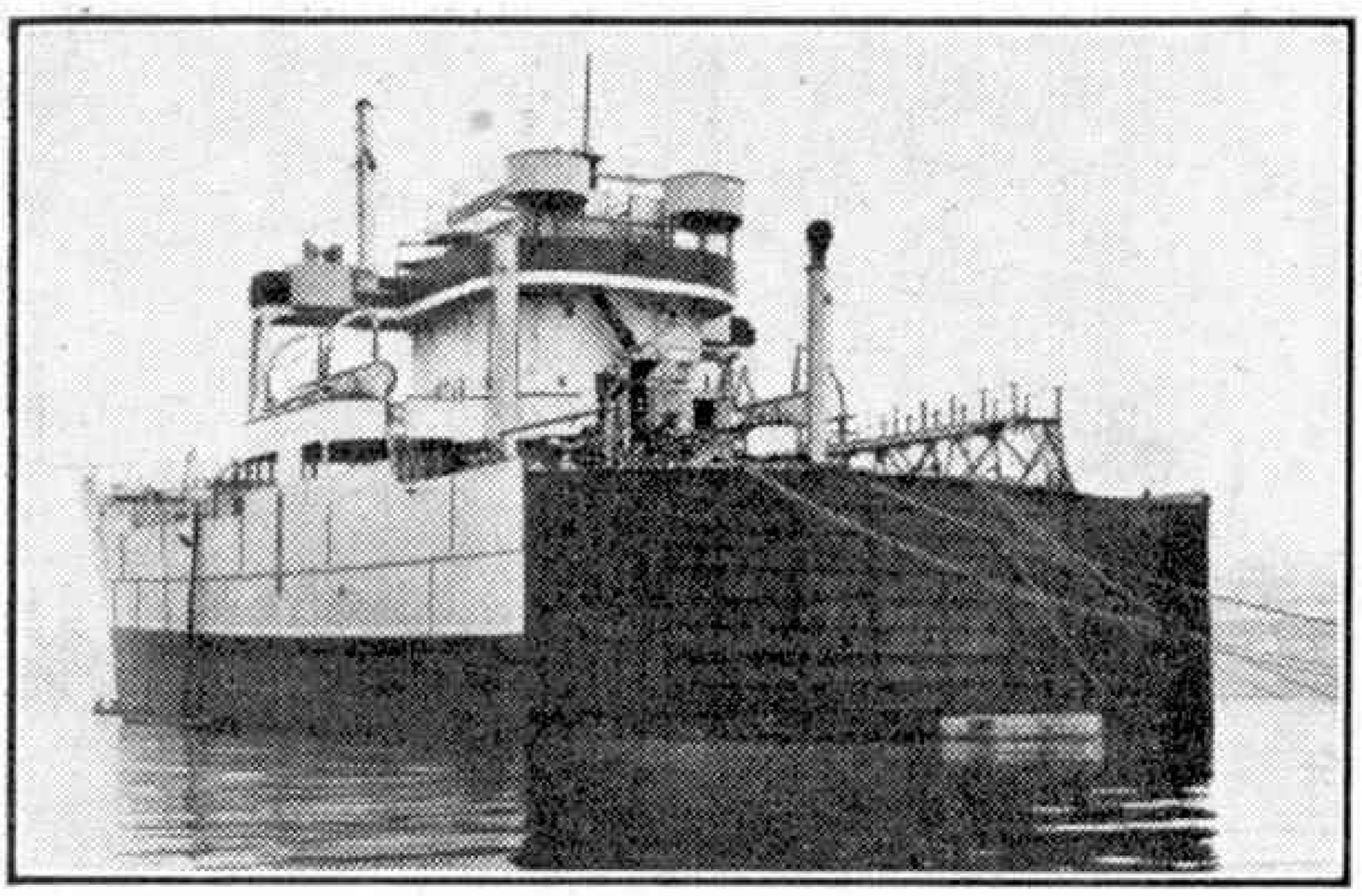
Where a shipowner is prepared to go to greater expense, he may choose to have his vessel lengthened as well as re-engined, thus providing more space for cargo and passengers. This job has to be done in a dry dock, the ship being first floated on to the blocks piled at the bottom of the dock, then left high and dry as the water is pumped out. The plating is cut through at the most convenient place and the hull divided.



The stern section of the tanker "Thorshovdi" arriving at the dock entrance on the Tyne for repair after being towed from the Strait of Gibraltar. The illustrations to this article are reproduced by courtesy of Swan, Hunter and Wigham Richardson Ltd., Wallsend.

Each open end is then made watertight and the dock is flooded again. The forward end is towed away through the dock entrance, leaving the stern portion to resume its rest on the blocks. Meanwhile, the new length of hull has been building in a shipyard near by. When complete, this is floated into the dock, as close to the stern section as possible, care being taken to keep them in alignment. The bow section, if the old one is being retained, follows next. All three pieces are then joined up to make the reconstructed hull.

There was an interesting case, a few years before the war, of two tankers being given new middle sections. This was not a lengthening of the hull, but a

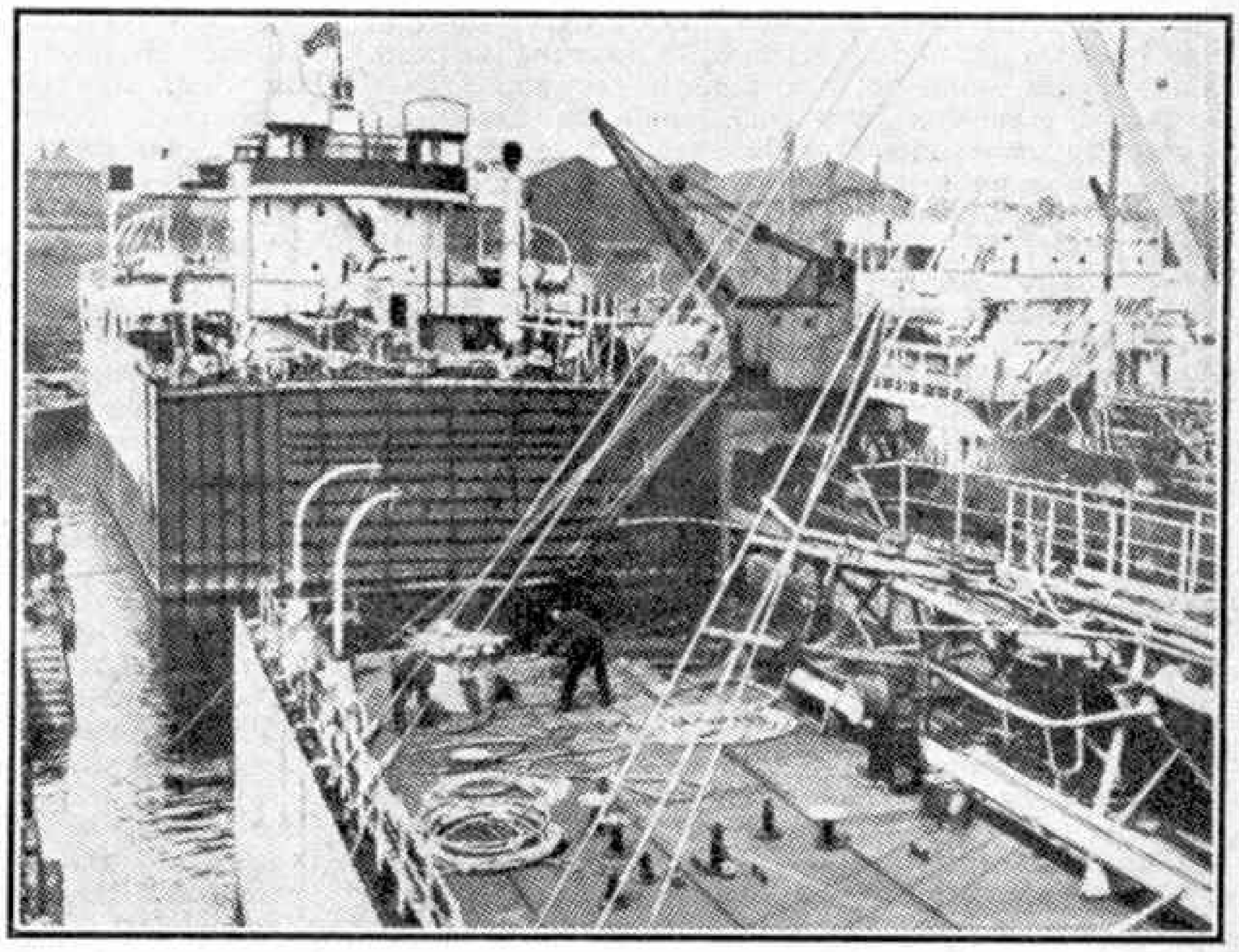


The bow section of the "Thorshovdi" was also towed to the Tyne from the Mediterranean Sea.

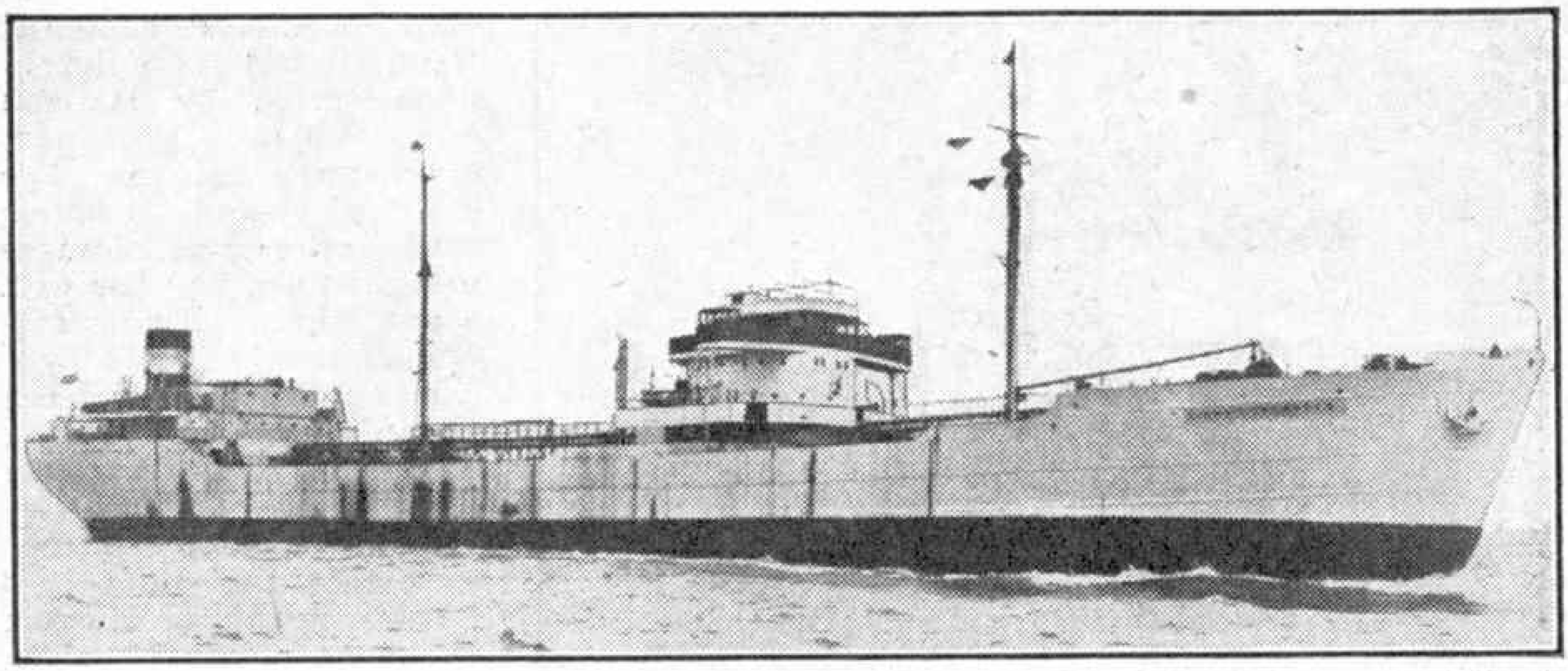
replacement of that part of it which had deteriorated from corrosion by spirit cargoes. The tankers, named *"Cadillac"* and *"Saranac,"* were booked for the operating theatre while they were still in service, and the new sections for each ship were actually built on the Tyne before they were taken in hand, thus saving valuable time. As soon as the tankers were available, each was put into dry dock and cut into three pieces. Only the stern section, containing the machinery, was left in the dock. The other two portions were towed out, the middle one being scrapped while the bow section was kept handy to follow the new middle part into dock. Despite the extensive nature of the work, it only kept the tankers out of employment for seven weeks.

One of the biggest reconstruction jobs carried out on British liners was that on the Union Castle liners *"Arundel Castle"* and *"Windsor Castle."* These fine vessels, of 19,000 tons, which had been built soon after the 1914–18 war, were well known by virtue of their four funnels. By 1937, however, their speed of 19 knots was below that demanded under the terms of a new mail contract secured by their owners. Both therefore were taken in hand at Belfast and completely reconstructed by Harland and Wolff Ltd., new machinery giving the increased speed required, while extensive changes brought them into line with new ships. Their four funnels were replaced by a pair only. The *"Windsor Castle"* was sunk by air attack in 1943, but her sister survived the war. With the modern tendency to reduce the number of funnels in liners, dummy smoke-stacks fitted for the sake of appearance have been removed from a number of ships while they were undergoing a refit.

Marine casualties bring most work to the ship surgeons. It is more than half a century since the liner *"Milwaukee,"* brand-new, stranded on rocks near Aberdeen. Her condition looked hopeless, with her forward end firmly gripped as in a vice. Then those in charge of the salvage decided on a novel idea, a last chance. They fashioned a belt of dynamite cartridges round the hull, just aft of where it was wedged, and exploded them to break the *"Milwaukee"* free. The broken end was patched up and the ship towed nearly 200 miles to the Tyne, where the operation of fitting a new bow



The two sections were floated together in dock in readiness for rejoining.



The "Thorshovdi" after reconstruction by joining the two halves of her hull. She is seen here on her trial trip before taking up service again under the new name of "Giert Torgersen."

was carried out by Swan, Hunter and Wigham Richardson Ltd.

A similar technique was employed a few years later, when the White Star "*Suevic*," twice as big as the "*Milwaukee*," grounded near the Lizard. Her bow had to be abandoned, but the stern was got into Southampton. A new bow was built at Belfast, towed to Southampton and joined to the salved portion of the "*Suevic*." The complete job cost about £50,000, but it saved the underwriters the expense of paying for a total loss.

The Royal Mail liner "*Lochmonar*," which also required a new bow after stranding in the Mersey in 1927, gave her crew an unusual experience. After she had been reconstructed, she returned to the river on her next voyage while her old bow was still visible. There must be very few ships which have been able to pass sections of their bodies after these had been removed!

This new bow technique had been well developed when the late war broke out, enabling many ships to be put back in service after severe damage from enemy attack. Tankers, in particular, are liable to break in two forward of the machinery, and there were numerous cases of stern halves being brought into port for rebuilding with fresh forward sections. Some vessels broke up from mine or torpedo damage in such a way that both parts could be salved and eventually towed into port for joining up again.

There was an interesting peacetime case of a ship parting company with her ends and finally having them restored. A cargo steamer named "*Linerton*" drove ashore near South Shields pier when outward bound in ballast, and broke her back. It was about five months later when the salvage party got her bow section afloat and towed it to the Tyne. The stern part followed some weeks afterwards, and both portions remained in the Tyne while their future was debated. It was decided to dispose of the pieces, as they were, to Dutch interests. Consequently, after suitable preparation, each part was towed separately to Rotterdam, where a shipyard reconstructed them into a complete ship again.

Where ships built to a standard design break in two, it is sometimes possible to fit the end of one to match the opposite end of another. Thus, during the 1914–18 war, the destroyer "*Zubian*" was fashioned out of half of the "*Zulu*" and half of the "*Nubian*"; it so happened that one destroyer had lost her bow and the other her stern. There has been a similar example quite recently concerning two of the American "*Liberty*" ships, an Italian yard contriving to make a new ship by joining separate halves of two different vessels.

A series of adventures brought another war-built ship back from the graveyard. In 1947 the cargo steamer "*Stancliffe*" grounded when proceeding up the Severn to Sharpness. She lay in a bad position and soon broke in two, only her deck plates holding the sections together. The cargo of pit props was removed, but a survey indicated that the ship was too far gone.

The harbour authorities then took matters in hand, chiefly with the idea of clearing the broken "*Stancliffe*" out of the way of other ships. Contractors were engaged to carry out the moving job, which started with a gigantic sewing operation. Holes were drilled in the plating on both sides of the break, steel cable was inserted and the two parts were drawn together as tightly as possible. In this condition the hull was dragged 100 yds. nearer the shore. The harbour authorities then advertised it for sale and awaited developments.

It chanced that a Newcastle firm was on the lookout for a bargain, and the "*Stancliffe*," despite her condition, seemed a fair investment. Her stitched-up hull was therefore bought for a moderate sum and orders were given to Messrs. C. H. Bailey of Cardiff to make it shipshape again. Men were sent to cut the hull completely in two, patch up the broken ends, and tow them separately into dry dock for rejoining. A difficult feature of this job was the bad condition in which the bottom of the ship proved to be when examined. It was so battered that, after the ends had been joined, the hull had to be propped up while the bottom was removed and new work built in. Finally, after one of the most extensive operations ever carried out on a ship, the "*Stancliffe*," now freshly painted and rechristened "*Gripfast*," emerged from the Bristol Channel to start seafaring anew.

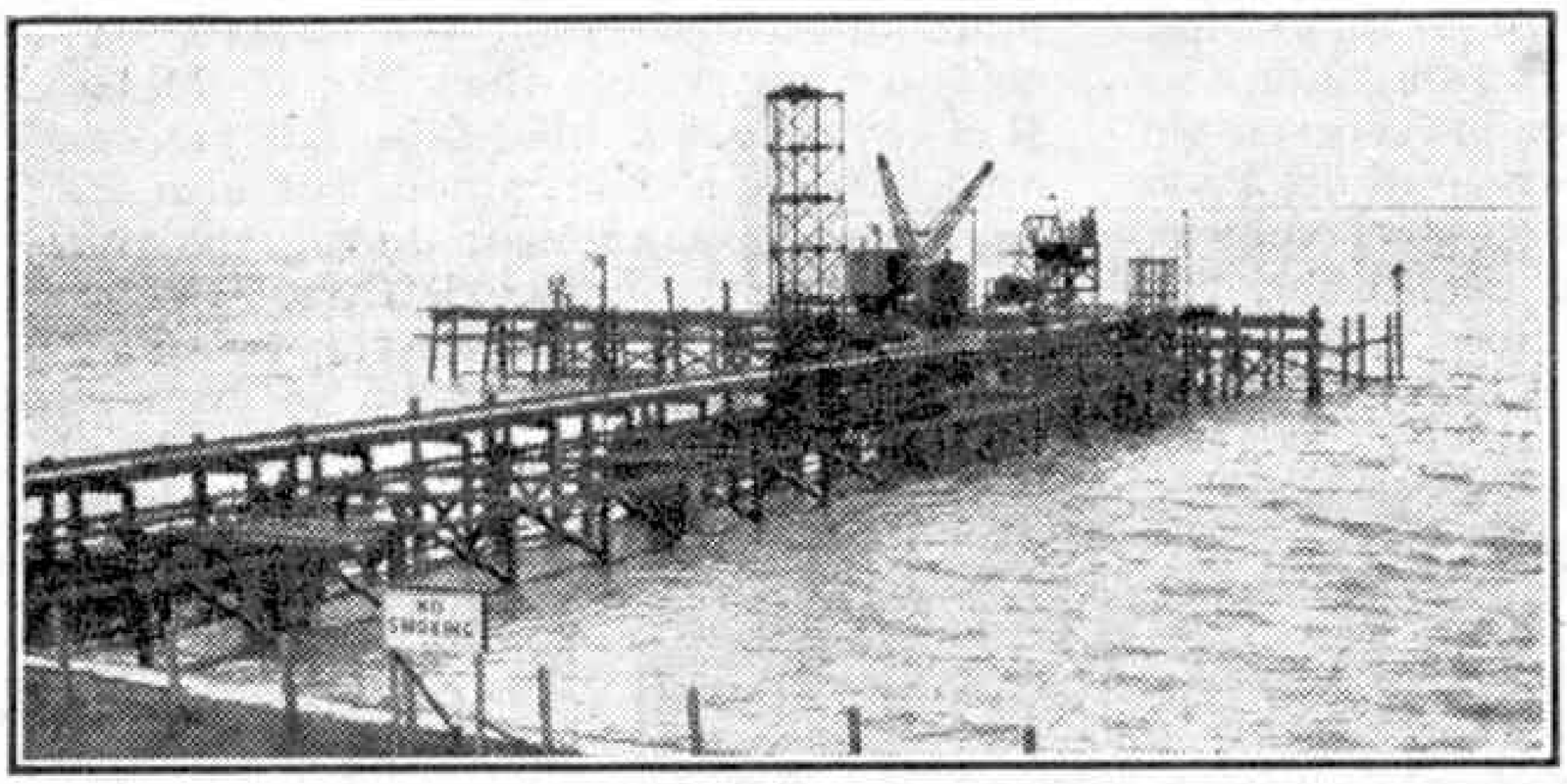
Numerous surgical operations on ships were carried out both during and after the war by Swan, Hunter and Wigham Richardson Ltd. Apart from several new bows for ships, they had a particularly interesting contract with the tanker "*Thorshovdi*." This vessel had been employed by the Admiralty on fuelling duty in the Mediterranean, and in 1943 she fell victim to an attack with limpet mines, attached to her hull by Italian divers. Wartime conditions made her immediate repair impossible, so the separate sections had to remain as they were for about three years. The odd point was that one part of the ship was at Gibraltar, used for storage purposes, while the other found its way across to the coast of North Africa.

In 1946 it was found possible to have both sections towed to the Tyne. No time was lost in getting the ends into dry dock together. The sections were then carefully lined up, the space between them was filled in and the hull was rejoined. On 4th December 1946 the completed ship was undocked, and after changing her name to "*Giert Torgersen*" she was soon ready for further service.

Building a New Oil Jetty

The Largest in the Thames Estuary

A NEW type of oil jetty that will be the largest in the Thames Estuary is now under construction at Thames Haven. This will be completed early next year.



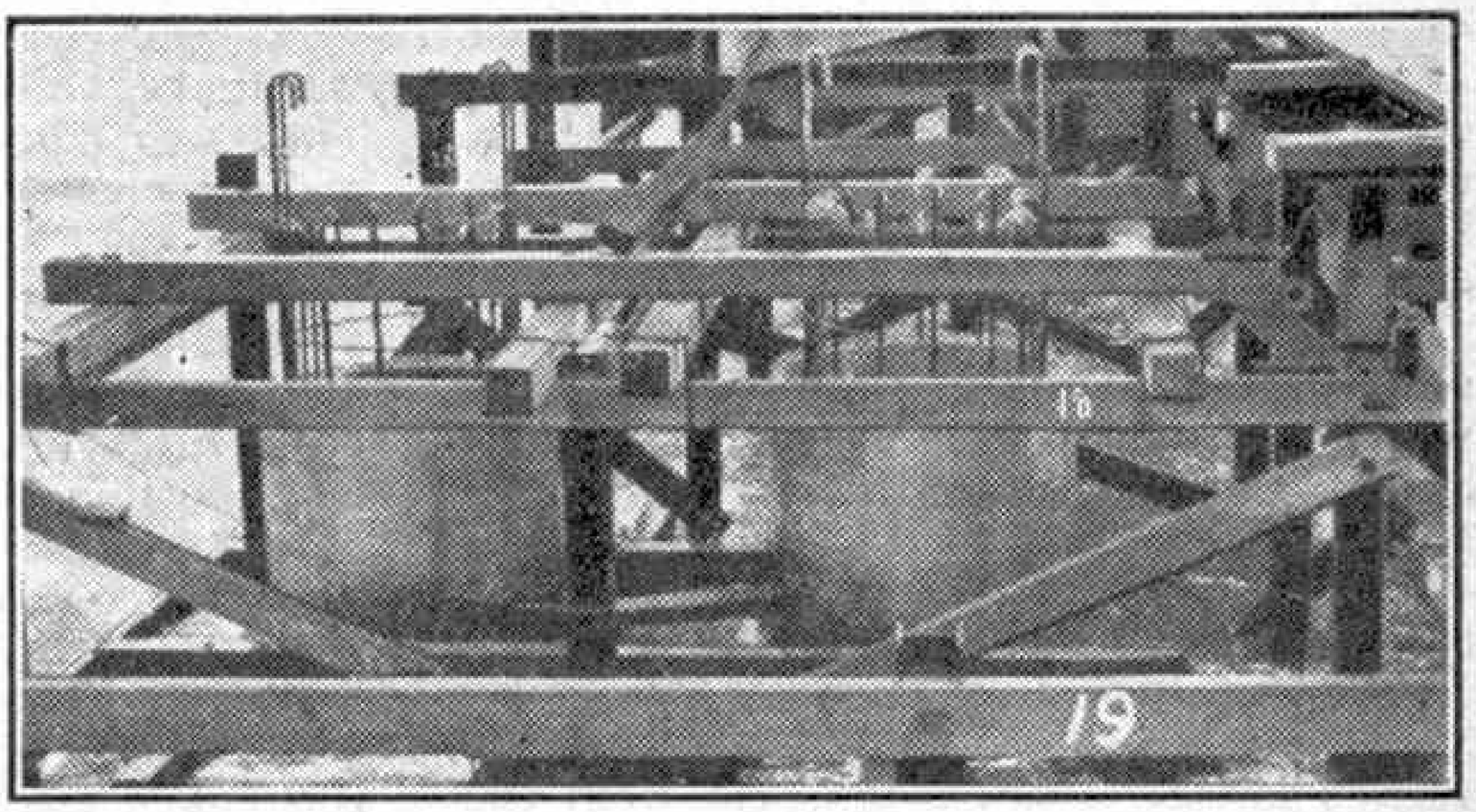
The largest oil jetty in the Thames Estuary under construction at Thames Haven. Shell photographs by courtesy of London and Thames Haven Oil Wharves Limited.

It will be capable of accommodating tankers of up to 38,000 deadweight tons, 7,000 tons more than the largest oil carrier now in service; and among the vessels that will make use of it will be the Shell Company's new 28,000-ton super tankers, the first of which, s.t.s. "*Velutina*," was described in the "*M.M.*" for January last. These vessels will bring oil from the Middle East and other sources for the nearby Shell Haven Refinery, which is already in full operation with a capacity of over two million tons a year.

The new jetty is remarkable for its novel construction. It is supported by a series of reinforced concrete cylinders sunk into the river bed, and its beams and fenders will be of pre-stressed pre-cast concrete. Beams of this material have never previously been used in jetty construction. The fenders too are of a new type, based on a patent by Professor A. L. L. Baker, B.Sc., M.I.E.E. Each is suspended by four chains and absorbs the energy of impact of vessels coming alongside by an inward and upward movement.

The construction of the jetty is being carried out by John Mowlem and Co. Ltd. for London and Thames Haven Oil Wharves Ltd., who, under arrangement with Shell, are providing also jetty facilities and much of the tank storage capacity required for incoming crude oil and outgoing refined products. It is being built in the shape of a letter L, with the longer approach arm 414 ft. long and 23 ft. wide, and a shorter arm, or "head," that has a length of 240 ft. and a width of 40 ft. Its cost will be £300,000.

The concrete cylinders that will support the jetty are 8 ft. in diameter, and each consists of pre-cast reinforced hollow cylindrical sections, each 8 ft. in length. These are spigot jointed together, and each bottom section is fitted with a steel cutting edge for penetrating the river bed. Heavy weights, about 120 tons on each, are used to sink the cylinders to a depth of about 34 ft., and these are then filled with concrete suitably reinforced. The total quantity of (*Continued on page 526*)

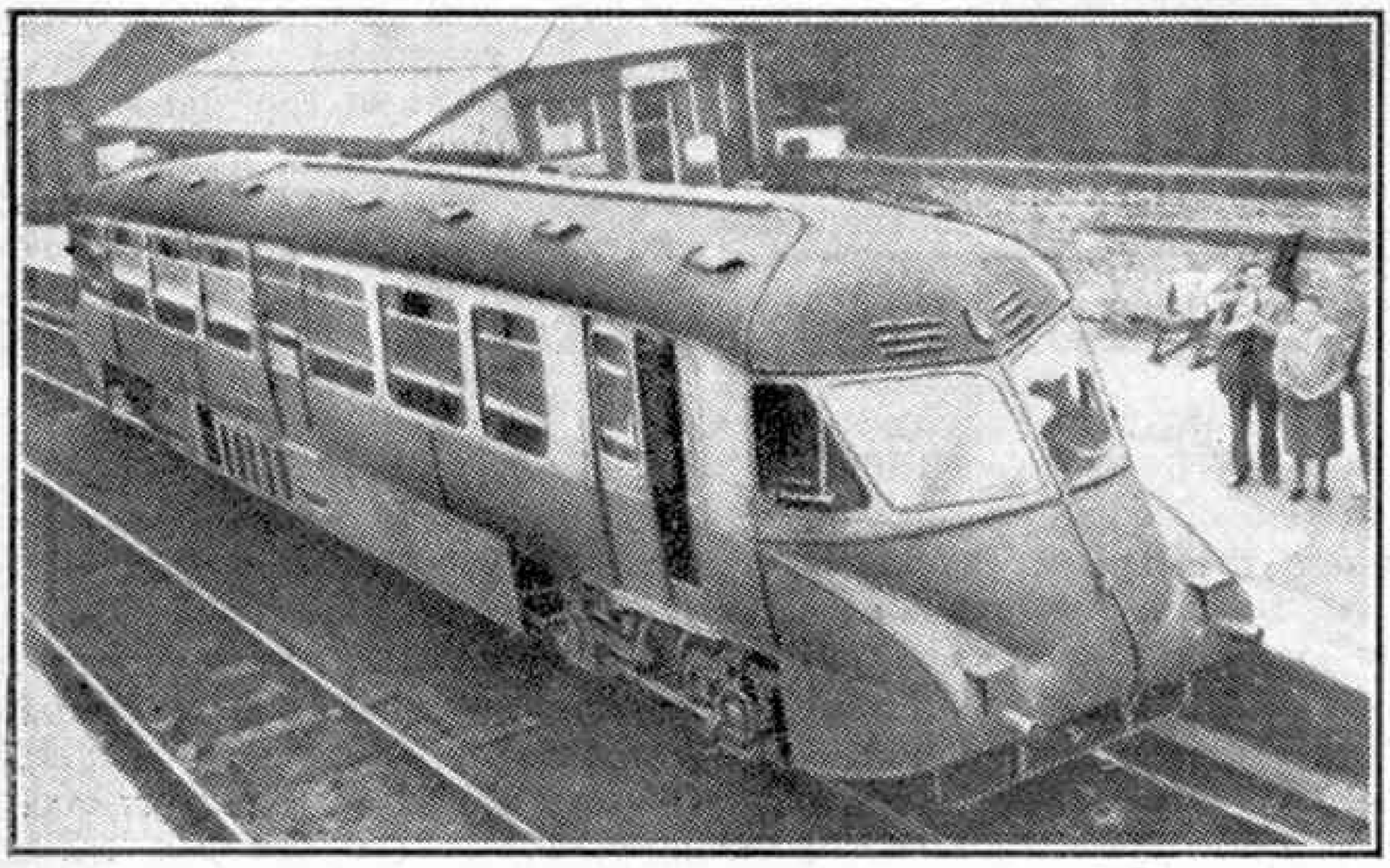


Reinforced concrete cylinders sunk in the bed of the river form supports for the new oil jetty at Thames Haven.

A Tour by Diesel Railcar

By O. Humberstone Prosser

IN July last year the Birmingham Locomotive Club organised a tour of railway branches in the Forest of Dean which lost their passenger services in 1929. The trip was very popular and was repeated two months later, when ex-Great Western diesel railcar No. 7 again left Moor Street Station, Birmingham, at 8.40 a.m. The sun shone bravely as we shot off southward to Stratford-on-Avon in the comfort of a steel-on-steel vehicle. Through Cheltenham and Gloucester, the car reached Berkeley Road Junction, where it turned off for Sharpness. Here



Great Western type 70-seater diesel Railcar No. 7 at Lydney Town on the special trip described in this article. This view shows clearly the characteristic end outlines of these vehicles.

the Docks and Inland Waterways Executive keep a stud of small 0–4–0 saddle tanks in a suitably diminutive shed near the end of the Berkeley Ship Canal and we were able to visit them resting from their usual duties of shunting on the quayside near by.

With all aboard once more, we ran parallel with the docks lines for a short way, passed through Sharpness Station and entered the cutting which gives access to the majestic Severn Bridge, a tall and imposing structure which is almost a mile long and must surely rank as one of Britain's foremost engineering triumphs. Wide expanses of sand and estuarine waters formed a noble prospect from the windows as we passed over, but even better were the views of the bridge itself as we swung round through Severn Bridge Station and headed for the tunnel beyond it.

There was a stop at Lydney Junction for those who wished to inspect the locomotives on the shed there; but at the station there was a railway relic even more interesting than the engines. This was a poster of the former Midland Railway, which a kind fate had preserved not only from destruction but also from any great disfigurement during the thirty or more years of its existence. The map of the system shown on the poster was still beautifully clear, and so were the inset pictures of the centres of the principal cities or towns served.

After lunch we struck off northward from Lydney Town station, the terminus of regular passenger services, though there were football excursions from Parkend during 1950. A short way past Parkend, our diesel car reversed and followed the line to Coleford. This is a typical Forest of Dean branch, as one realised on looking out of the front window. Ahead stretched the grass-grown, rusty single track, piercing the dense pine forest like the solitary messenger of civilisation in what, otherwise, was a lonely and silent sanctuary of peace in a troubled world. The trees come close up to the lineside and in places form almost an alcove of leaves and branches above the track. Even when the sun shines, it is dark and melancholy in such places. Stiff climbs and sharp curves abound on this and the other branches. Although in bottom gear and exerting all her power, the diesel car found it such hard work to haul her full load of passengers up the 1 in 30 stretches that at times we were down to only 5 m.p.h. So much the better; to have gone faster would have been to insult the magnificent views with which benevolent nature has besprinkled this wonderful Forest.

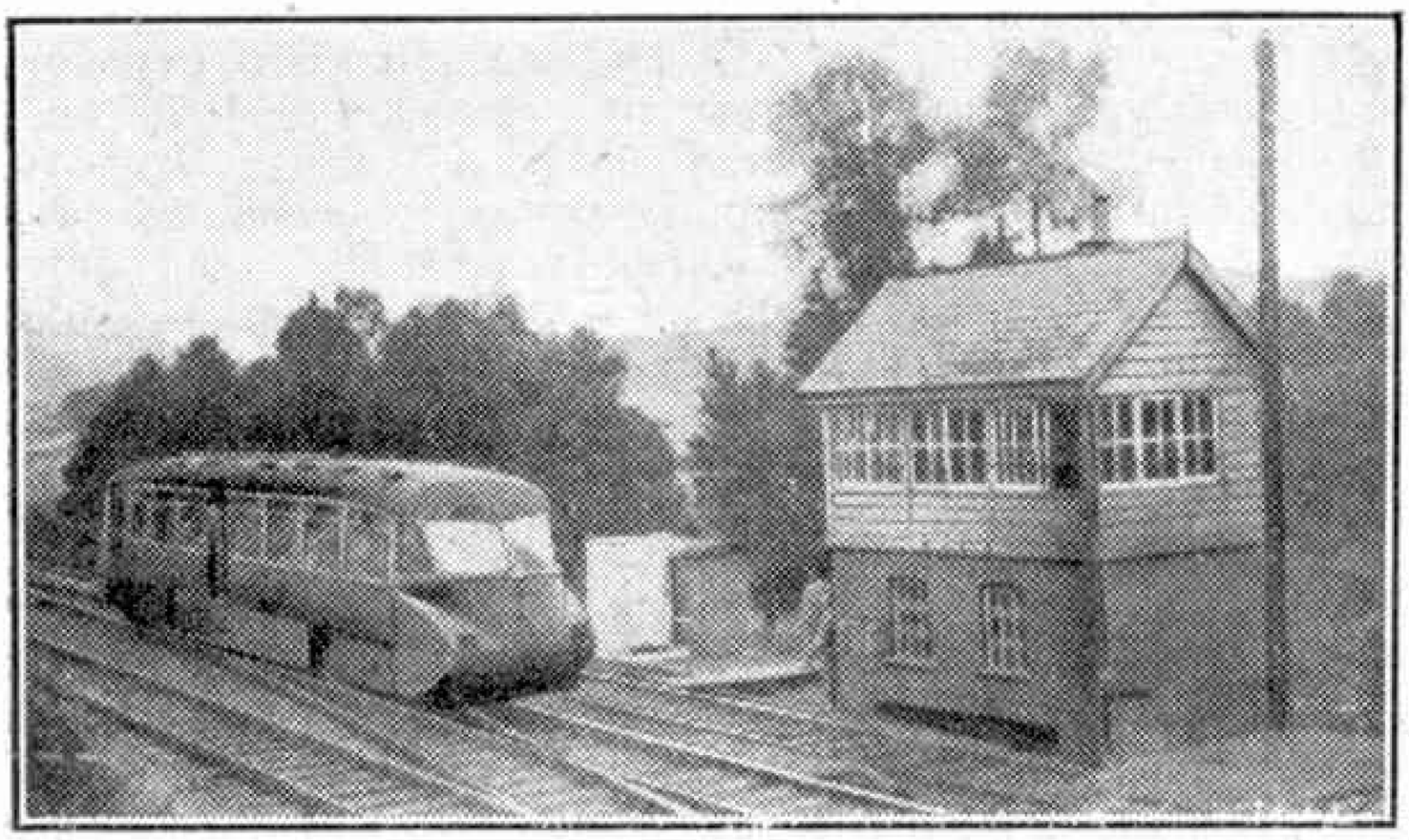
The platform clearance at Coleford was too small for the car to draw further forward than the position shown in the photograph; as it was, the side rested against the platform edge. The return run to the junction was at higher speed, for, apart from the initial climb out of the terminus, the grade now favoured us. So back we glided, heeling over to round the sudden curves and seeing numerous boards instructing the drivers of freight trains to stop dead before descending.

On the way from Parkend to Cinderford we passed old collieries and metal mines which, when in production, caused the building of the branches and the ancient plateways that preceded them. Beyond Serridge Junction we went over the track which was the most worth-while of all to cover; this section, having lost all its traffic to the other route into Cinderford, had been officially abandoned some time before the visit, and was not even shown in the working time-table. This doomed line took us into Cinderford where during half an hour's wait we were provided with the entertainment which the push-pull motor-train from Newnham, like others of its kind, is so well able to give. It bustles into its terminus, briskly shunts in the yard, and returns to the platform. There the staff load all kinds of goods aboard and the driver oils up the motion as the little 0–4–2 tank stands there as demurely as the best behaved cow that was ever milked.

On returning to Serridge Junction we ran on to the branch to Lydbrook, and almost immediately came to a curve even sharper than the usual. "*This,*" said the pilotman to those gathered about him at the entrance to the driver's cab, "*is what we call Speculation Corner: we always wonder if we shall get round it.*" The most scenic part of this run came towards the end, near the village of Lower Lydbrook. The single track is carried high above road and houses on a shelf cut in the hill sides, at one place passing through a tunnel cut in the bare rock without any facing. This gives an appearance similar to that of the old Welsh Highland Railway tunnels in Aberglaslyn Pass. After following this commanding position along the hill sides, the line crosses the valley by a tall viaduct, and so reaches Lydbrook.

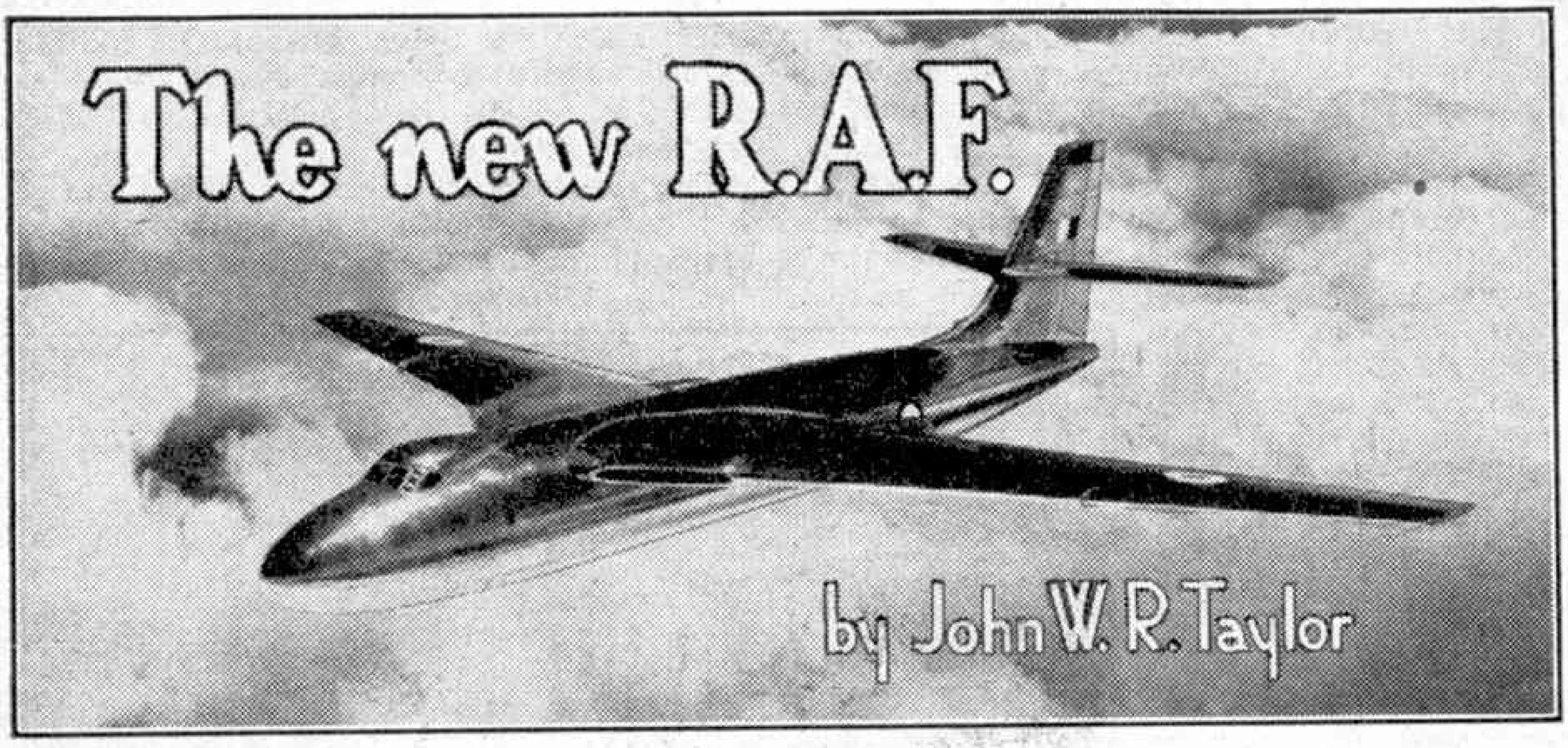
Our return to Birmingham was by way of Hereford, Worcester, and Kidderminster. Like a free and eager spirit rejoicing in the new-found freedom of the open plains, after a day where the curves and gradients of the Forest branches cramped her style, No. 7 fairly flew along straight stretches of main line track. Perhaps our driver realised that he carried on this trip a more appreciative load of people than usual!

Coleford Station, where lack of platform clearance prevented the railcar reaching further along than the position shown. Photograph by Ken Yates, Birmingham.



Railcar No. 7 at Serridge Junction signal box. The route from Cinderford had already been abandoned when the journey was made.

The new R.A.F.



by John W. R. Taylor

THERE is no such thing as a perfectly equipped air force. The most that any country can hope is that it will have the right types of aircraft in service in the right numbers at the right time to do a particular job. Choice of these aircraft would be easier if there were such a thing as a perfect warplane; but once again there is not. In fact, aircraft and aero-engine design are advancing so rapidly that by the time a new fighter or bomber is in production, there is usually a better one already on the way.

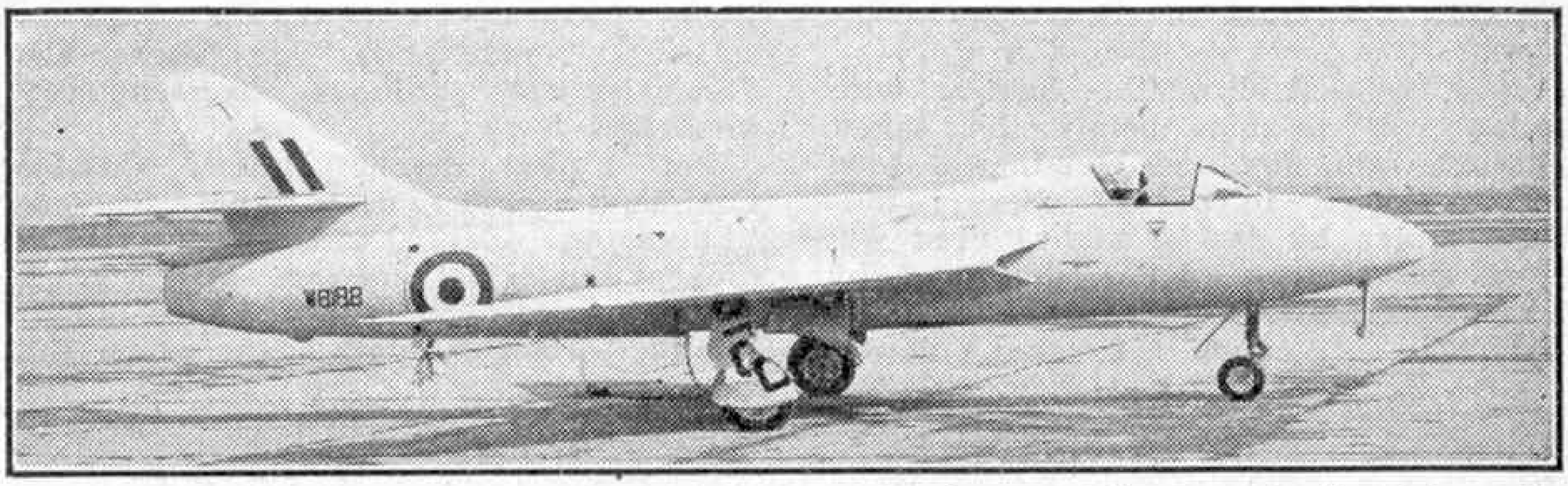
The only method of keeping 100 per cent. up-to-date would be to buy every new type as it were built; but quite apart from the fact that pilots would hardly get used to one aeroplane before being switched to a new one, this would prove far too expensive. A modern bomber, for example, costs as much to build as a pre-war naval destroyer. Consequently, promising aircraft often have to be rejected; and this leads to serious complications. In the case of our own country to-day, it has put the R.A.F. in the unhappy position of being outclassed for the first time in its history by two other important air forces—those of the United States and Russia.

The picture above shows the Vickers "Valiant," Britain's first four-jet bomber, now on order for the Royal Air Force. Photograph by courtesy of Vickers-Armstrongs Ltd.

To discover why we must go back to 1945, when we had just won the second "war to end wars." There seemed little need then to spend money on new weapons, as the possibility of another war seemed remote, at least for many years. So, as the R.A.F. had vast fleets of aircraft in hand, the Air Ministry decided to make do with these for a time, and wait until a new generation of ultra-fast fighters and jet super-bombers could be developed before re-equipping Fighter and Bomber Commands. It did not seem much of a risk, as the new jet-propelled "Meteor" and "Vampire" fighters were fast, formidable, reliable and obviously capable of further development; the "Lincoln" was the last word in heavy night bomber design; and the "Mosquito," "Tempest" and "Hornet" were all leaders in their respective classes.

Even when it became obvious after a year or two that the golden age of peace had failed to materialize, the Air Ministry refused to change its plans. Improved versions of the "Meteor" and "Vampire" were ordered, as they could supersede earlier marks on the assembly lines quickly and without great expense. But the fast new Hawker P.1040 and Supermarine "Attacker" were regarded only as stepping-stones to better fighters; and even when they were given swept wings and developed into the P.1052 and Type 510 respectively in 1949 the Air Ministry was still not interested. Something faster, more powerfully armed and with greater range was needed.

Meanwhile, Bomber Command still flew its outmoded "Lincolns" and "Lancasters," and waited for the promised jet bombers. To improve its striking power, 70 surplus B–29 "Superfortresses" were obtained from America in 1950 and put into service as "Washingtons," but it was impossible to hide the fact that the Command was

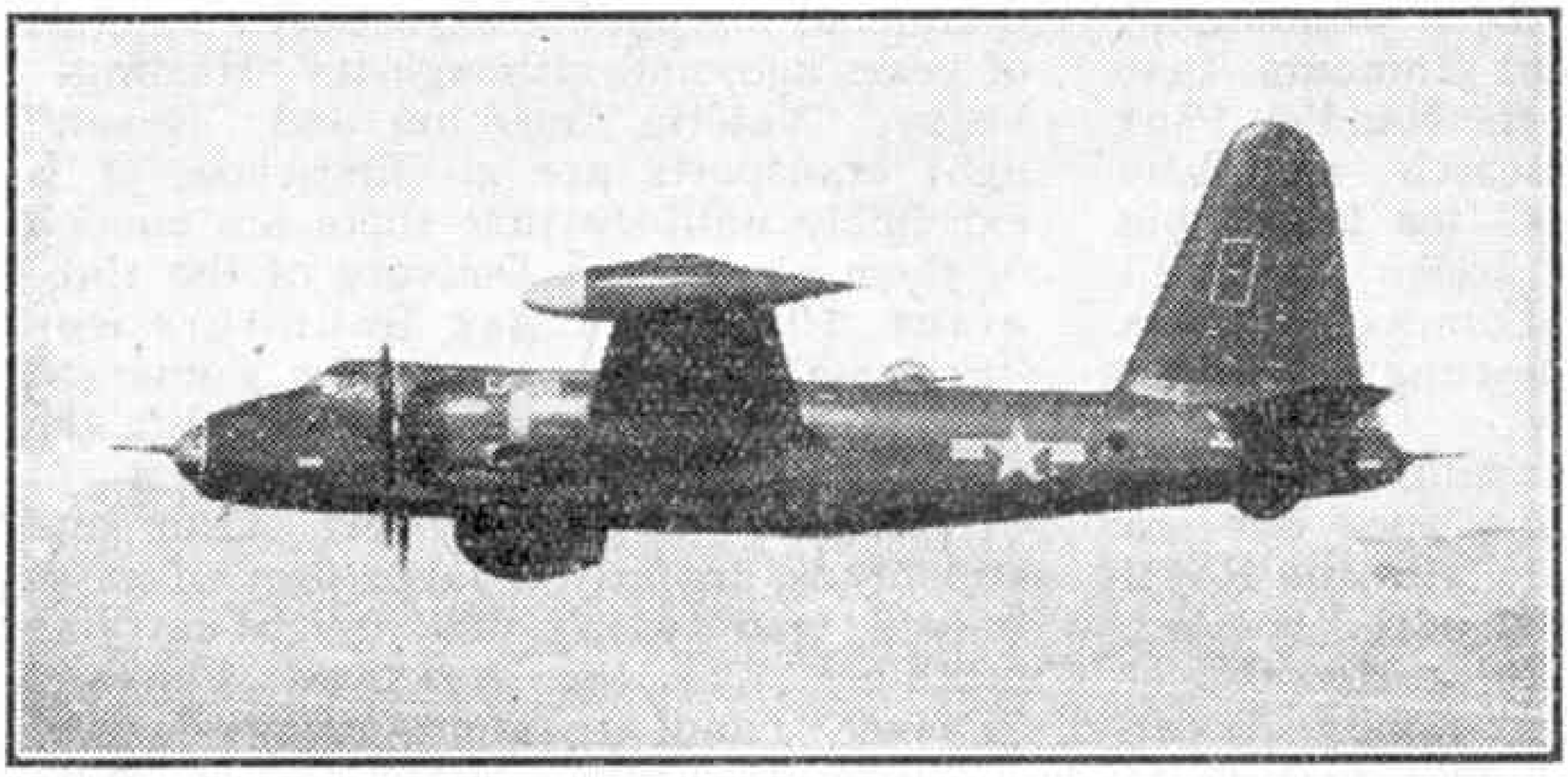


Hawker P.1067 jet fighter, which has been called "the world's fastest and finest warplane" and is now in production for R.A.F. Fighter Command. Photograph by courtesy of Hawker Aircraft Ltd.

becoming a pale shadow of the all-powerful British wartime bomber force.

By the middle of last year it seemed that the Royal Air Force had reached its lowest ebb. The latest "Meteors" and "Vampires" were good sturdy fighters, able to climb faster and fight better at high altitudes than any others in service in the world. But their speed could not be compared with that of the U.S.A.F.'s North American "Sabre," or the new MIG–15, reported in service with the Soviet Air Force. Similarly, there were still no squadrons of British jet bombers; whereas at least five types had flown in America, of which one was in service and another in big-scale production. The fact that British jet engines were acknowledged to be far and away the best and most powerful in the world made the whole situation seem even more absurd, and the only heartening feature was a revival of the Royal Air Force Display, at Farnborough, which proved that our pilots and aircrews at least had lost none of their old skill and dash. But the most courageous and clever pilot in the world cannot hope to survive in war if his opponent has a faster, better, more powerfully armed aircraft, and it was obvious that the R.A.F.'s equipment was no longer good enough.

Now, however, thanks to developments during the last 15 months or so, there is an indication that by 1953 the Royal Air Force should once again be the envy of the world. One after another, prototype fighters, bombers and research machines, which our aircraft industry has been developing in secret, have flown and been made known to the public. Furthermore, one of the jet bombers, the English Electric "Canberra," and a whole range of British jet engines, have proved themselves so outstanding that they are also being built in America for the U.S.A.F.

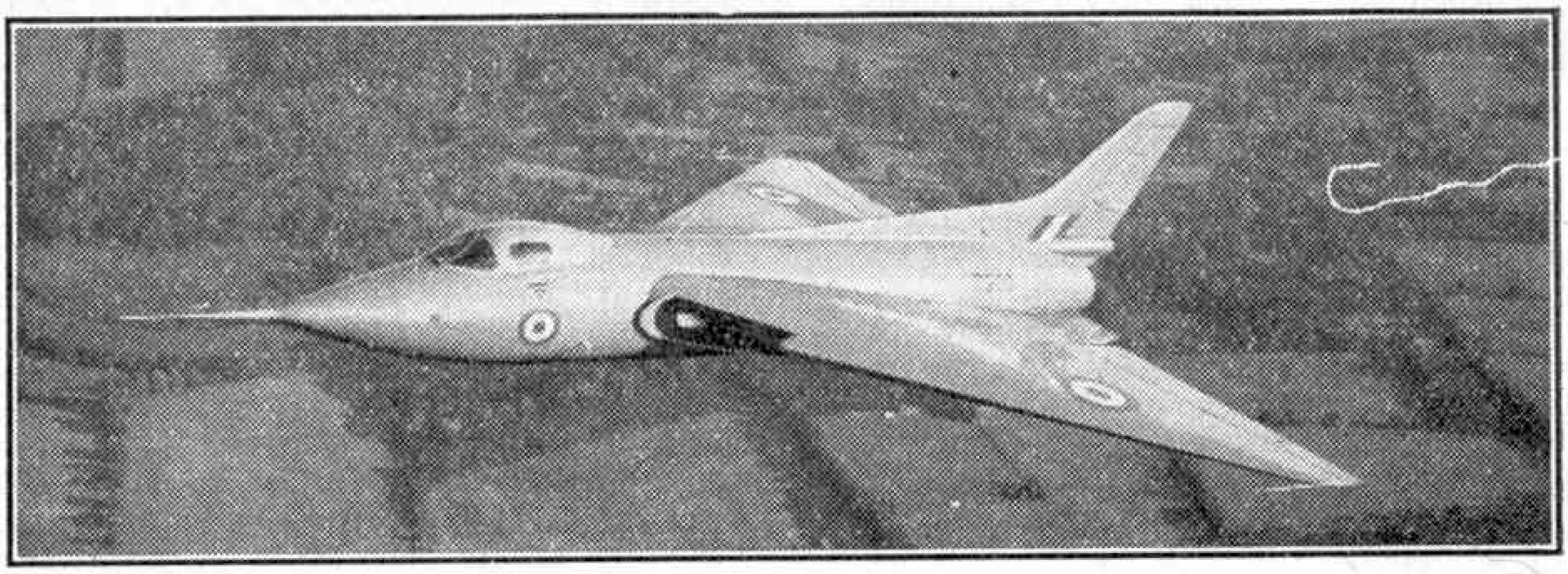


The newest version of the U.S. Navy's prime anti-submarine aircraft is the P2V–5 "Neptune," shown here, soon to be delivered to R.A.F. Coastal Command. Photograph by courtesy of Lockheed Aircraft Corporation, U.S.A.

At last we can see the new R.A.F. taking shape, for its "Vampires" will soon begin to be replaced by faster, more powerful "Venoms," and the first "Canberra" squadrons are coming into service with Bomber Command. Beyond these aircraft are the new Hawker P.1067 and Supermarine "Swift" jet fighters, each powered by a Rolls-Royce "Avon" engine; and the superb Vickers "Valiant" bomber, which has four "Avons" buried in its swept wings, giving the equivalent of more than 50,000 h.p. No details of the performance or warload of these machines may yet be given, but they are

certainly the finest of their type in the world.

New two-seat all-weather fighters, with radar "eyes" to guide them to their target through rain, fog and cloud, will soon be in service, to protect these islands from attack by day or night. First will come the "Meteor" NF11, developed by Armstrong-Whitworth, then the de Havilland "Venom" 2 and newer, revolutionary machines of phenomenal power and speed.



The Avro 707A delta, which points the way to the supersonic fighters and giant flying wing super-bombers of the future. Photograph by courtesy of A. V. Roe and Co. Ltd.

Re-equipment of Bomber Command's tactical squadrons with "Canberras" is well under way. The bigger, faster, more formidable "Valiants" will come next, followed by other, still secret "heavies." Short's counterpart to the "Valiant"—the SA/4—has already been announced, and there are persistent rumours that the Avro 707A delta and the Handley Page 88 "scimitar"-wing research aeroplane are "flying scale models" for future big bombers of unorthodox design. So both Fighter and Bomber Commands seem assured of having world-beating equipment within two or three years.

What of Coastal Command, faced with the vital task of keeping open our sea supply routes, side-by-side with the Royal Navy? Its new over-water patrol bomber, the Avro "Shackleton," is a worthy offshoot of the "Lancaster-Lincoln" family. It can carry a good load of bombs and radar "search" equipment for long distances, and offers new standards of crew comfort. In addition, the Command will soon receive from America a number of the latest Lockheed "Neptune" patrol-bombers, which are among the most powerful and efficient submarine hunters and killers in the air. But one can only regret that there is as yet no sign of a flying boat replacement for Coastal's superb "Sunderlands," to share the "Shackleton's" arduous, tremendously important work.

For air-sea rescue duties, Coastal Command still uses the veteran "Lancaster," adapted to carry an airborne lifeboat under its fuselage and sets of Lindholme survival gear. And to obtain the meteorological data upon which the success or failure of modern air warfare often depends, it uses specially-equipped Handley Page "Hastings," passenger and freight-carrying versions of which are standard equipment in Transport Command's "heavy" squadrons.

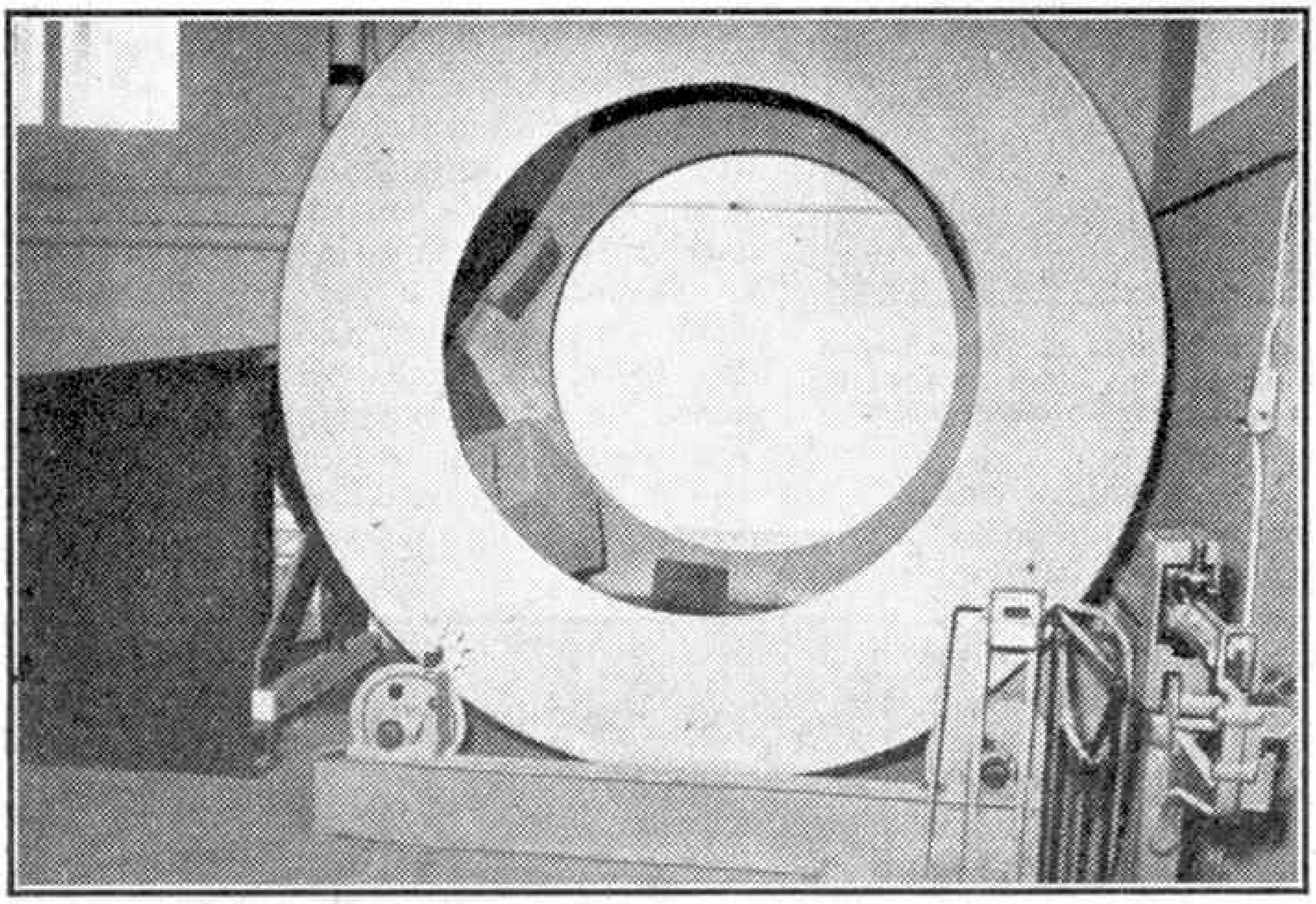
Despite the lessons of World War II and the Berlin Air Lift, Transport Command was cut back drastically a couple of years ago; and although its "Hastings" heavy, "Valetta" medium and "Devon" light transports are all first-class, it is extremely unlikely that there are enough of them in service. Delivery of the three giant 200-passenger Saunders-Roe "Princess" flying boats to the Command will be a big help, as each can lift the equivalent of a whole squadron of "Hastings"; but Transport Command still needs urgently a large fleet of easy-to-load paratroop and freight-carrying machines like the American Fairchild "Packet," and it would be good news to learn that Blackburns had received an order for their fine "Universal Freighter."

But, of course, in the end an air force is only as good as its aircrews and groundcrews, and even when money was scarce the R.A.F. did not begrudge buying new and up-to-date training machines. As a result, Flying Training Command is perhaps one of the (*Continued on page 526*)

In Search of Perfect Packaging

By Trevor Holloway

PACKAGING is a matter of vital importance to almost every industry, particularly to-day when so many of Britain's products are destined for the export markets. Comparatively few firms could afford the necessary time and money to conduct their own long-term research into packaging problems, but fortunately there is at Leatherhead, Surrey, a highly efficient and well-equipped research centre ready and willing to investigate almost every conceivable packaging problem for firms large or small.



The drum tester at Patra House, in which packages are subjected to rough treatment to test the durability of the packing material.

The Printing, Packaging and Allied Trades Research Association, usually known as PATRA, is one of the research associations that operate under the Department of Scientific and Industrial Research. It was originally formed in 1931 to serve the printing trade, and was then known as PIRA; but it became urgently necessary in the war years to add packaging to its research programme. Three years ago the £110,000 laboratories at PATRA House were opened by the Duke of Gloucester to replace the old premises at Robin Hood Court, just off Fleet Street, which were bombed by the Luftwaffe in May 1941.

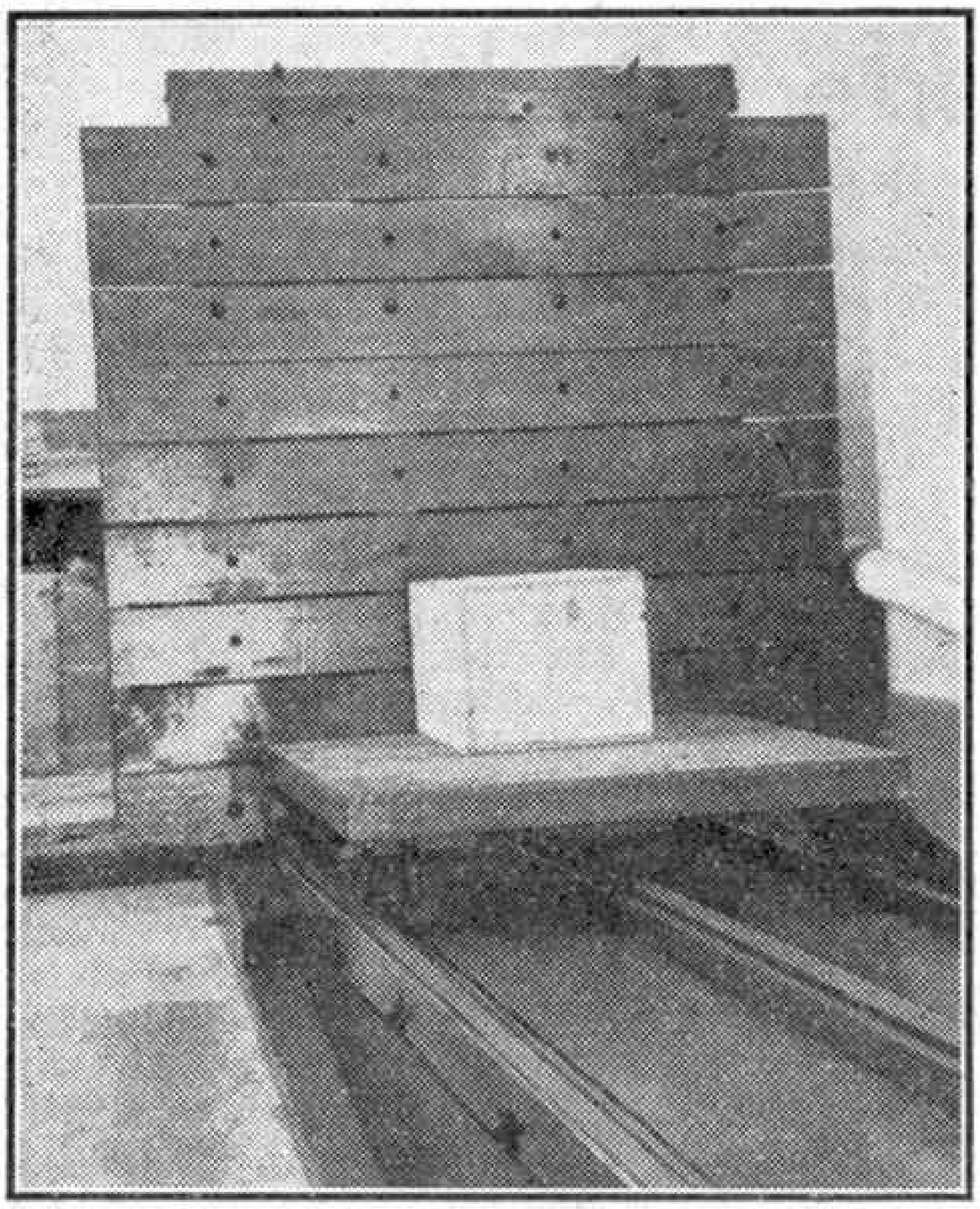
The Packaging Division has been humorously likened to a cross between a chamber of torture and a battle school for postmen. To a certain extent this is not a bad description, for at PATRA House parcels and packages are subjected to the "cruellist" forms of treatment scientists can devise.

Packages are given some pretty rough handling by means of weird and wonderful-looking apparatus that might have been the handiwork of Heath Robinson. For instance, there is a huge contraption called the Drum Tester, definitely a "trial by ordeal" instrument for giving a package a "rough house."

It is a revolving metal drum about 7 ft. in diameter, not unlike the old-time treadmill, and is electrically driven. Inside it are wooden baffles, set at various angles. The package to be tested is placed within, the drum is set in motion, and the "torture" begins. The angles of the baffles are such that the case or carton slithers from one baffle to the next as the drum rotates, falling heavily on its sides, corners and so on, until usually it becomes very much the worse for wear.

After a while the package is taken out and minutely examined to see how it has stood up to its ordeal, and where, if any, its weakest spots are. In other words, it is subjected to what may be termed a scientific post-mortem. The firm from which the package has come is then sent a detailed report by the Laboratory of its findings and recommendations.

Then there are the Drop-Testers. One is a suspended sling arrangement fixed to a rope and pulley, the sling itself having a special quick-release attachment. Packages are raised three or four feet from the ground and then suddenly



Another form of violence used in tests at Patra House. The trolley carrying the package runs down an inclined plane and crashes into a solidly built wooden buffer.

allowed to drop at various angles on to a bed of solid concrete. For purposes of the test the case may be filled with flour or sand of the same weight the case is expected to contain. The pack may survive—or there may be a crunching thud and up may rise a cloud of flour.

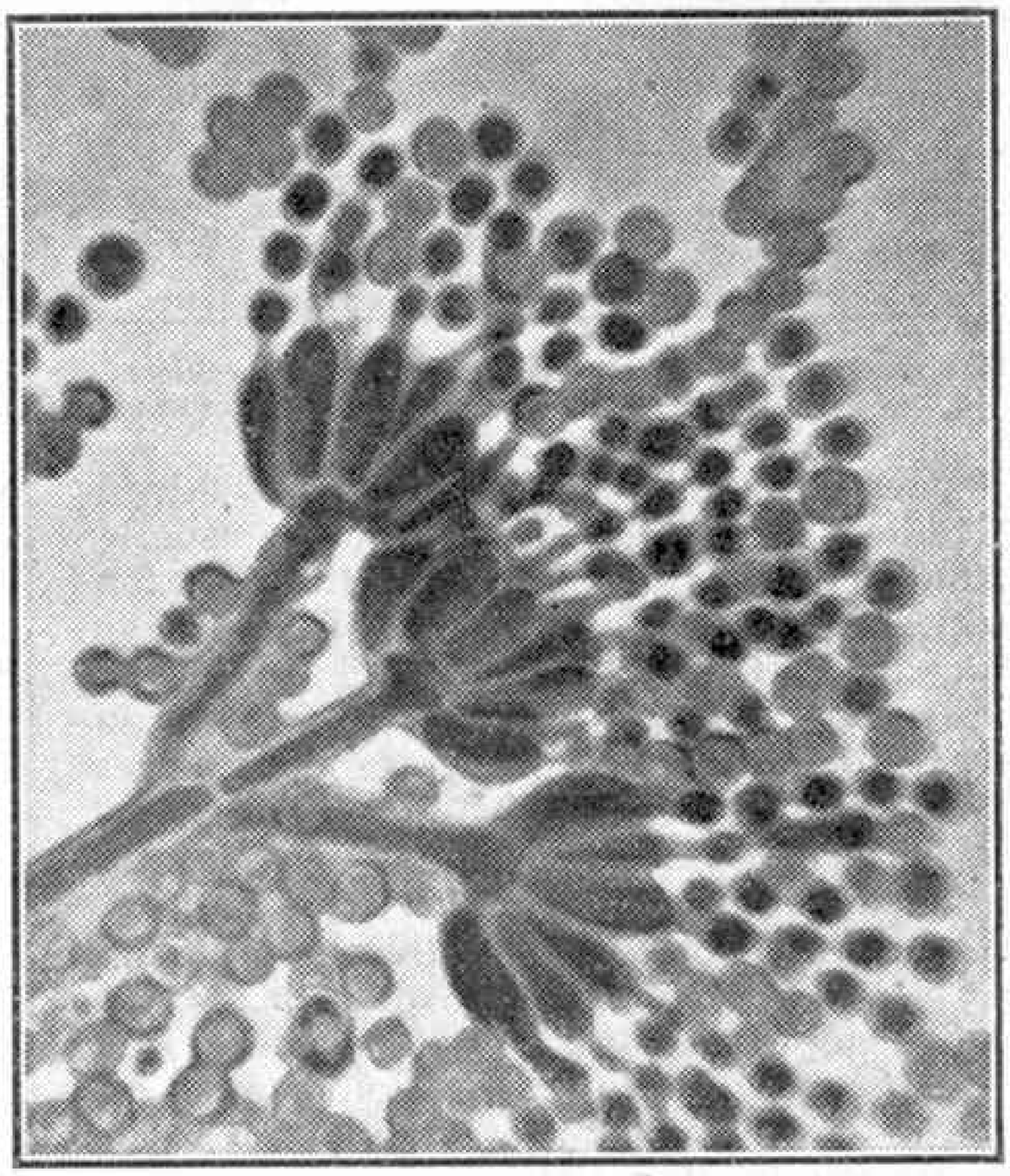
The other Drop-Tester, an altogether bigger job, is affectionately referred to by the staff at PATRA House as the "Hangman's Drop." This is designed to test heavier and bulkier packages up to 500 lb. or so. The containers are placed on dividing trap doors some 15 ft. above floor level, a catch is released, and down crashes the container to its fate. As with the Drum Test, a post-mortem is held and, with as much care as a man from the C.I.D., an official takes down the particulars of the "casualty," noting where it failed and why.

Yet another ordeal in store for packages sent to Leatherhead for testing is the Inclined Plane Impact Test. The sound of noisy crashes will lead you to a device that is in the nature of a steeply-sloping 25 ft. incline down which rushes a flat trolley on rails. A package is placed on the trolley at the top of the incline and the trolley is then sent headlong down the slope to crash into a solidly-constructed wooden buffer. The effect on the package is much the same as would befall it aboard a carelessly shunted goods train, only more so.

It is indeed a curious kind of laboratory we have described so far. Instead of the conventional quiet and orderliness most of us associate with a research centre, here we encounter what at first seems chaos and Bedlam! It is nothing of the sort, of course, but it represents science at work on very important research under conditions, for the packages, that prevail during transportation by road, rail or sea.

But not all the Packaging Division is concerned with these knock-about tests, for there are other and subtler methods of putting a package or packaging materials on trial.

Goods for despatch to tropical regions often need to be guarded against attacks from destructive insects. Packages in warehouses or in transit may be attacked by various moulds, or be exposed to petrol or gas fumes; and it is necessary also in many cases to guard against grease or damp penetration. All these factors can affect not only the strength of the packaging materials, but also the contents of the packages themselves.



A mould that attacks packaging material, seen under magnification of 1200.

Cheese, butter, fats and other foodstuffs may be ruined after the container has been contaminated from the outside, and extremes of heat and cold have also to be reckoned with.

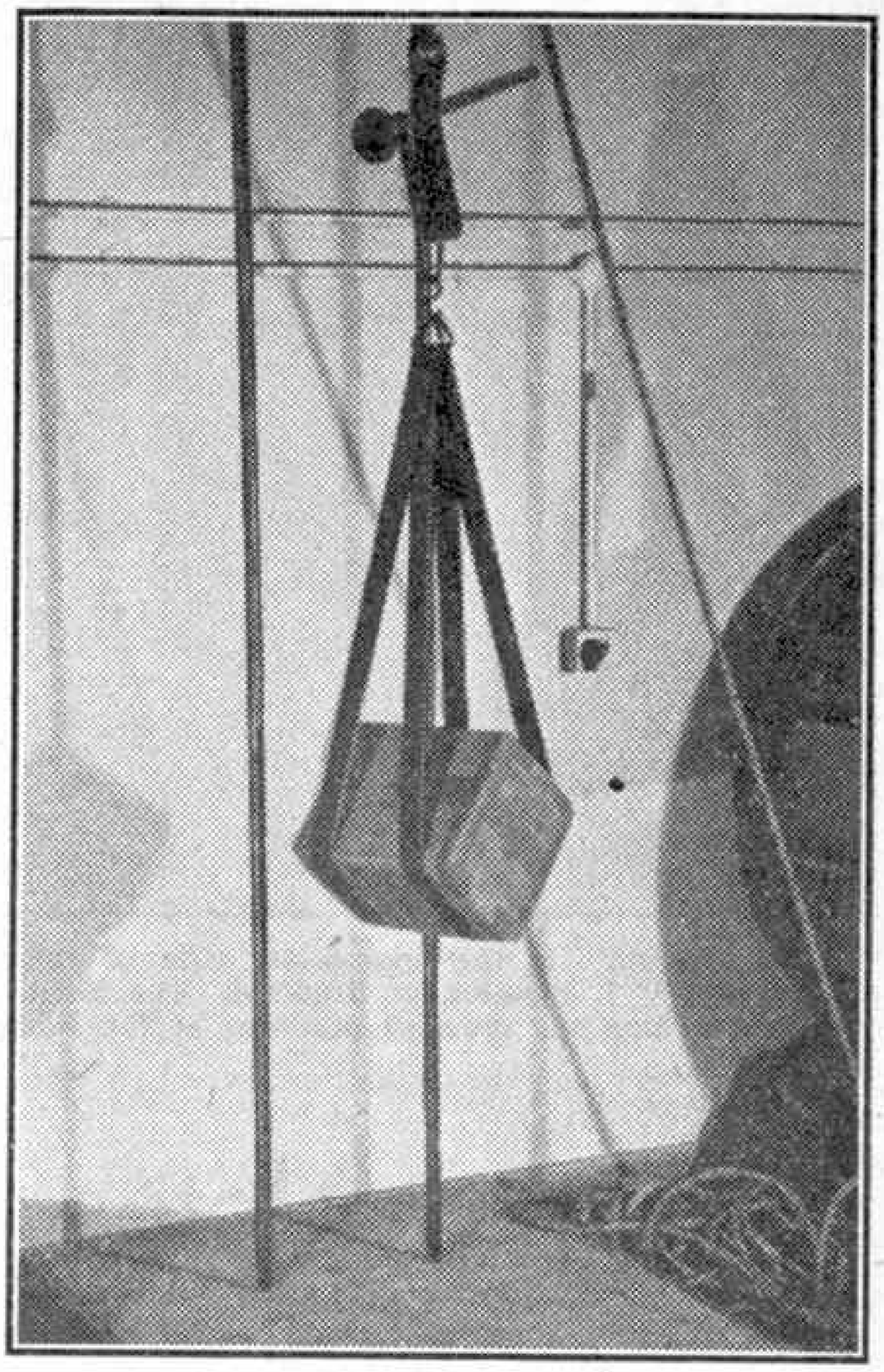
PATRA scientists have studied all these problems. Sections of the Laboratory coming under the heading of mycology, entomology and microscopy are a strange contrast to the more boisterous research conducted in the basement of the building. Numerous types of British and foreign insects are bred and their habits and appetites closely studied. In this way the scientist, by allowing the insects to attack various packaging materials, can ascertain which materials are most vulnerable, as well as experiment on the best types of deterrent and how to apply them.

The common cockroach is a notorious attacker of packaging substances, and if ever you pay a visit to the Laboratory you will probably be shown an English specimen preserved in a jar and affectionately referred to by the staff as "Henry." He measures about $1\frac{1}{2}$ in. by $\frac{3}{4}$ in. You will also see jars containing numbers of formidable-looking live insects.

Moulds are microscopic plants, and by their growth they can stain the materials on which they live or cause an objectionable musty odour which eventually taints the contents of a package.

A wide range of moulds therefore is cultivated at the Laboratory and introduced to packaging materials, so that their action, likes and dislikes may be constantly studied. From such observations the scientist gains information for seeking methods of checking growth, either by chemical means or by establishing what materials are naturally most mould resisting. Few people realise what a vast range of different moulds exist. The Laboratory have no less than 25 large volumes cataloguing moulds that have been identified during the past 70 years or so.

In special "ovens" the size of a small room, packages are stored under tropical, temperate or Arctic conditions, and constant temperature and humidity maintained. If Messrs. So-and-So want to know what effect the climate of Central Africa will have on their packages, PATRA can give them a very good idea. One problem met with in tropical climes is that labels frequently come adrift. This is a matter of no small concern to the customer, especially where foodstuffs or medicinal products are involved, and

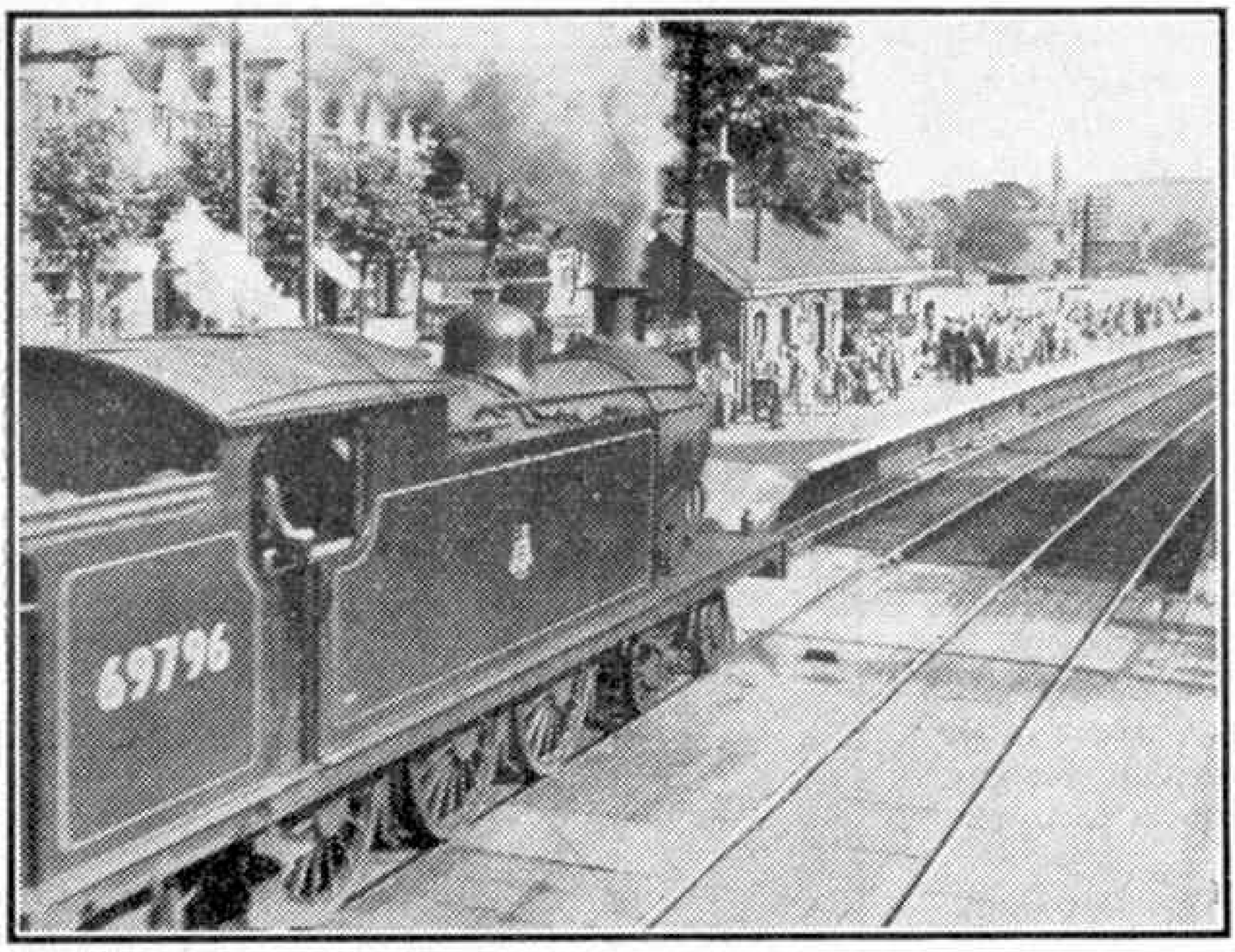


Drop tester, with a package in position ready for dropping on to a bed of solid concrete.

the Laboratory has given much valuable advice on ways of overcoming this problem.

The PATRA Laboratories rank among the finest of their kind in the world and are said to surpass in efficiency even those in America, a country which has long had the reputation of being "package conscious," as they call it over there. Actually there are two angles on this perfect package business. A package may be sub-standard and not man enough for its job, or on the other hand a firm may be using a package that is far and away too efficient for its purpose, thereby wasting a considerable sum of money every year.

"Let's get in touch with PATRA," British businessmen are saying in ever-increasing numbers. "They will solve our packaging problems." And with the aid of Henry's relations in the insect "farm," the gadgets in the "chamber of torture," etc., coupled with infinite patience and scientific skill, the staff at this Leatherhead research centre seldom have to admit defeat no matter how elusive the problem may prove.



"Day Excursion" is the appropriate title of this "M.M." prizewinning photograph by J. Langton of Bradford. The North Eastern 4-6-2 tank is approaching the crowded platform at the Botanic Gardens, Hull.

Railway Notes

By R. A. H. Weight

National News

British Railways are to establish a school for training apprentices at Crewe. Building is expected to begin shortly on a site adjacent to the Locomotive Works. There will be very complete accommodation on a much larger scale than the existing school at Derby, which has proved very successful. Boys will join at the age of 15, and will receive preliminary practical and theoretical instruction to fit them for the type of work in which they will specialise on becoming apprentices in the locomotive or other technical departments of one of the Regions.

During the recent International Congress on Refrigeration held in London, an interesting display of railway vans and containers used for conveying refrigerated or cool-stowage produce was arranged at Kensington (Olympia) station. These included fish and fruit vans fitted for running with through loads between the mainland of Europe and Great Britain by means of the train ferry services. A specially interesting exhibit was one of the new Transfesa (Spanish) refrigerator vans with interchangeable axles for working over the wider Spanish gauge as well as standard gauge tracks.

At the beginning of September new B.R. class "4" 2–6–4Ts from Brighton Works were in service up to No. 80014 on the Central section of the Southern Region.

Western Tidings

Class "4" 4–6–0s of British Railways design Nos. 75001–4 and upward are in course of completion at Swindon. Ten "Britannia" 4–6–2s have been built at Crewe. These form the second series of this "7" type, and are allocated to the Western Region, subject to trial periods with individual engines elsewhere. They are: No. 70015 "*Apollo*," 70016 "*Ariel*" and 70017, "*Arrow*"; 70018, "*Flying Dutchman*"; 70019, "*Lightning*"; 70020, "*Mercury*"; 70021, "*Morning Star*"; 70022, "*Tornado*"; 70023, "*Venus*"; and 70024, "*Vulcan.*" Allocations include: Nos. 70017 and 70020, 81A, Old Oak Common, London; 70019, 83A Newton Abbot; 70021, 83D, Laira. Additional 0–6–0Ts built by contract lately were Nos. 8472–3, 9449–53.

The Gas Turbine locomotive, No. 18000, was back in service on the Paddington-Bristol and London-Swindon runs towards the end of the summer.

On a summer run, the "*William Shakespeare*" express made up to 10 new standard coaches, including kitchen and restaurant cars, weighing about 370 tons full, and hauled by No. 4096, "*Builth Castle*" with a Wolverhampton crew, was not very brisk after attaching the Stratford-on-Avon portion at Leamington until after restarting at Banbury. But the train passed High Wycombe to time in spite of a succession of permanent way or signal checks, taking things fairly easily on to London. Arrival was made at Paddington, after a signal slowing, within a few seconds of the booked 10.10 p.m. Net time for the 67½ miles was 80 min., maximum speed 72 m.p.h.

With a 13-coach train weighing over 400 tons, No. 7023, "*Penrice Castle*," manned from Pontypool Road shed, did well over the steeply-graded route from Shrewsbury southbound on the through Manchester-Plymouth service, reaching Hereford, 51 miles, in 65 min. This was 9 min. less than the schedule, which includes a 7-min. recovery allowance. Time was kept nicely over Llanvihangel summit, where the minimum speed was about 26 m.p.h., then on through Abergavenny, with a maximum of 67 m.p.h., to Pontypool Road.

Reports have reached us of some excellent runs along the Paddington-Bristol main line when a considerable amount of lost time has been regained.

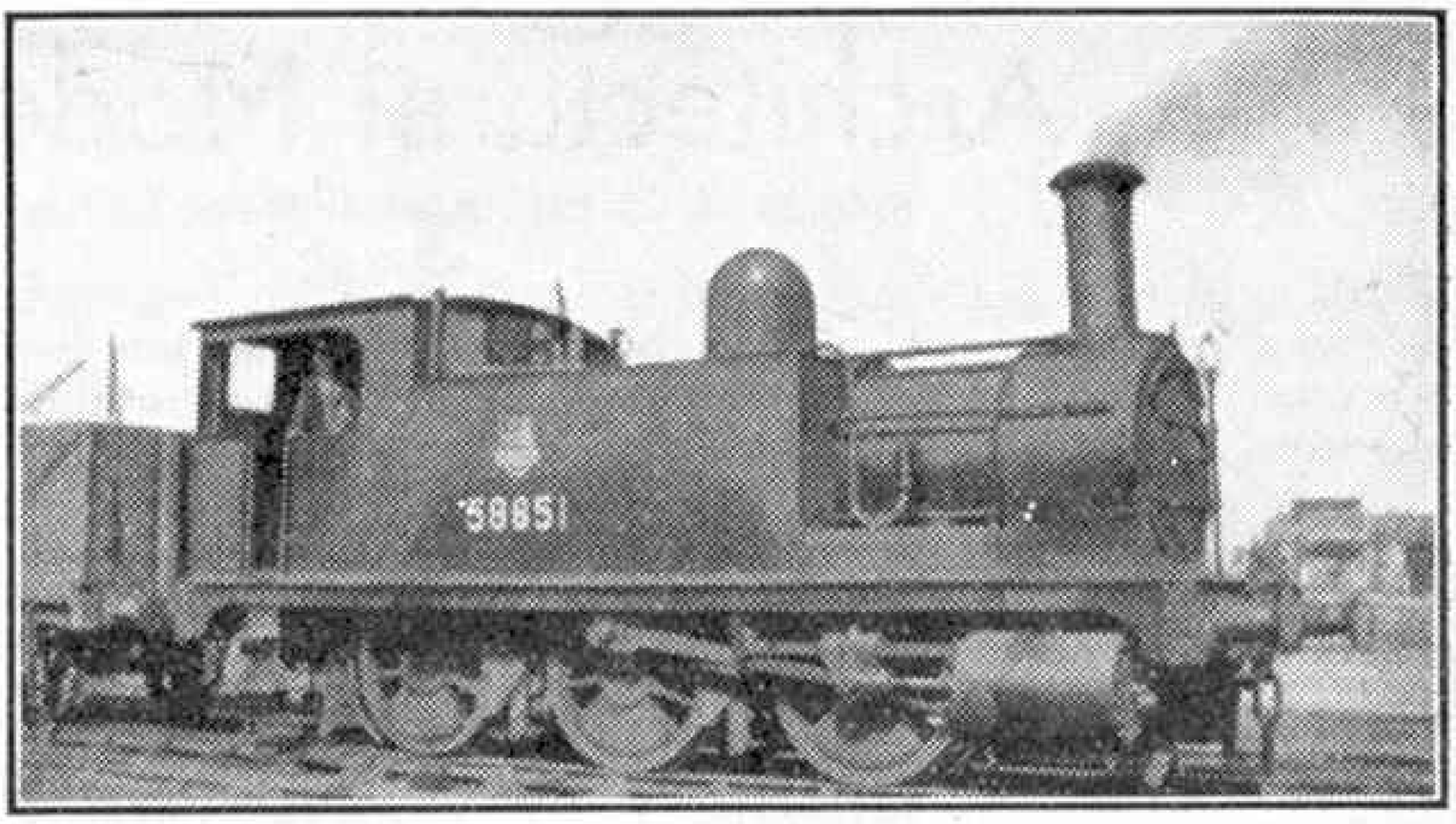
Interchange of Western and Southern Region locomotives continues over certain routes in Devon. Last summer black and white headboards similar to those of former L.N.E.R. practice were brought into use on the front of the locomotives hauling named trains, including the 2–6–2T working the Stratford-on-Avon portion of the "*William Shakespeare*" to and from Leamington Spa.

Special trains in connection with the Army training camps on the Cambrian coast, round about Barmouth and Harlech, involve the operation of fairly heavy loads over long stretches of single line on the former Cambrian Railway.

East Coast Route and Scottish News

Dark green paint is appearing on "A1," "A3" and "A4" locomotives which have lately received general overhaul at Doncaster. Nos. 60070 "*Gladiateur*" and 60076 "*Galopin*" are still painted apple green at the time of writing so will never be blue, but pass straight to the dark green shade. "A1" No. 60162 "*Saint Johnstoun*," finished in the latest style, was one of the Scottish engines lately working to King's Cross after repair at Doncaster. Previously No. 60159 "*Bonnie Dundee*" had been noted similarly.

The ex-Great Northern "K2" 2-cyl. "Moguls" continue to perform good work over the extremely difficult West Highland line. A reader writes: "I travelled by the 3.46 p.m. Glasgow-Fort William dining car train of 9 coaches. Nos. 61794 "*Loch Oich*" and 61790 "*Loch Lomond*" went to it with a will, and for all one knew the formidable banks scarcely existed." Some of the "K2s" there had been lately transferred and still had small G.N. cabs. "K4"



A veteran North London 0-6-0 tank bearing its B.R. emblem and number. The engine is shown working at Birkenhead Docks. Photograph by L. W. P. Reeves, Meols.

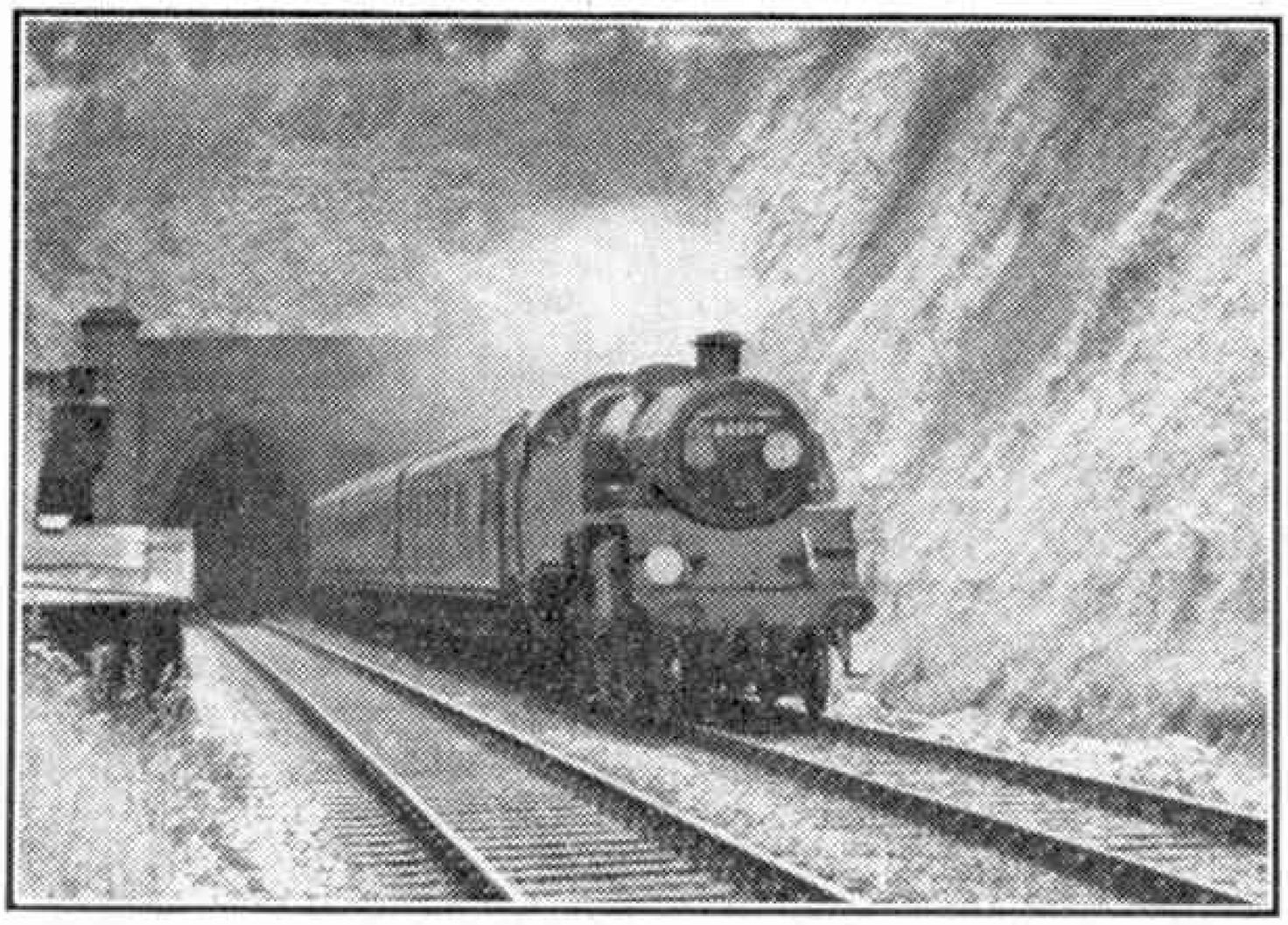
2–6–0s or "B1" 4–6–0s were noted on some of the trains, there being a good deal of double-heading in summer.

Reports of good locomotive work on the "*Capitals Limited*" express, which is booked during the holiday season to make the the record 392¾ mile non-stop run in each direction daily between Edinburgh, Waverley, and London, King's Cross, include a down journey last September with the Scottish "A4" engine No. 60009 "*Union of South Africa*." Grantham, 105½ miles, was passed in 114½ min. and booked times were adhered to fairly closely, although there had been several signal checks and severe slowings for various reasons as far as Newcastle. Such delays became more severe north of Morpeth, and at Chathill, in north Northumberland, came a signal slowing to walking pace, but the famous train fortunately did not have to stop as a clear road was secured just in time. Fast travel followed whenever opportunity offered, bringing the "*Capitals*" into Waverley by 4.48 p.m., two min. before time. Net time allowing for out-of-course delays was probably not more than 7 hr. 5 min.

Earlier in the year on the southbound run with the same load, about 460 tons of air-conditioned stock including restaurant, kitchen, and lounge cars, streamlined "Pacific" No. 60027 "*Merlin*" had been getting along uneventfully for 290 miles until south of Grantham. Then the express was pulled up at a signal box as a precaution, as some slight damage had been reported on a passing train. Examination showed all to be well, however, but 8 min. or more had been lost! Between Peterborough and Hatfield 58¾ miles were covered in 56½ min.; then the preceding main line train was "caught up," causing a string of signal checks. There was a diversion to slow line outside King's Cross, but the "*Capitals*" pulled up in No. 1 platform there at 5.7½ only 2½ min. behind time, again demonstrating considerable improvement on an accelerated timing.

From the London end, "*Mallard*" took a considerable share in running this express last summer. Crews stationed at Haymarket shed, Edinburgh, are in charge of the "*Capitals*" engine for the northern half of the journey, then between Tollerton (Yorks.) and King's Cross the footplate is manned by a London driver and fireman, exchange being effected by means of the corridor tender, which is in regular use for that purpose only on the summer "*Capitals Limited*" service.

Considerable changes are being effected in the allocation of "Pacific" locomotives and their duties on the Great Northern section at the time of compiling these notes, and we hope to give more detail next month.



New B.R. standard 2-6-4 tank locomotive No. 80010 on a stopping train at Riddlesdown, Southern Region. Photograph by R. Russell, South Croydon.

London to Oslo

The fastest service ever provided between the English and Norwegian capitals, except by air, was available last summer, allowing a through journey to be completed in just over 38 hours. Tourists left King's Cross on certain days by the 9.0 a.m. "*Norseman*," a handsome 9-coach restaurant car express, and made a fast run to Tyne Commission Quay, on the riverside below Newcastle, with a call at York to take up passengers. The crossing to Bergen was made in the Norwegian motor vessel "*Venus*," a miniature liner noted for speed and comfort. Thence the new diesel-operated "*Bergen Express*" covered the 307 miles on to Oslo over a mountainous and notably scenic route, including many severe grades and eight stops, in 7 hr. 50 min. The total time was just over 38 hr., involving travel during one night only, which was spent on the ship, instead of the two that had often been necessary hitherto.

G.N.R. (I) Competition at Bangor

In August last, a sand designing competition was arranged by Bangor (Co. Down) Borough Council for the G.N.R. Over 50 children whose ages varied between 6 and 14 took part, and first prize was won by a beautifully arranged and finished design based on a shamrock in a circle, with the slogan "*For distances near and far; Travel by G.N.R.*" All the competitors were presented with special Festival of Britain commemoration medals.

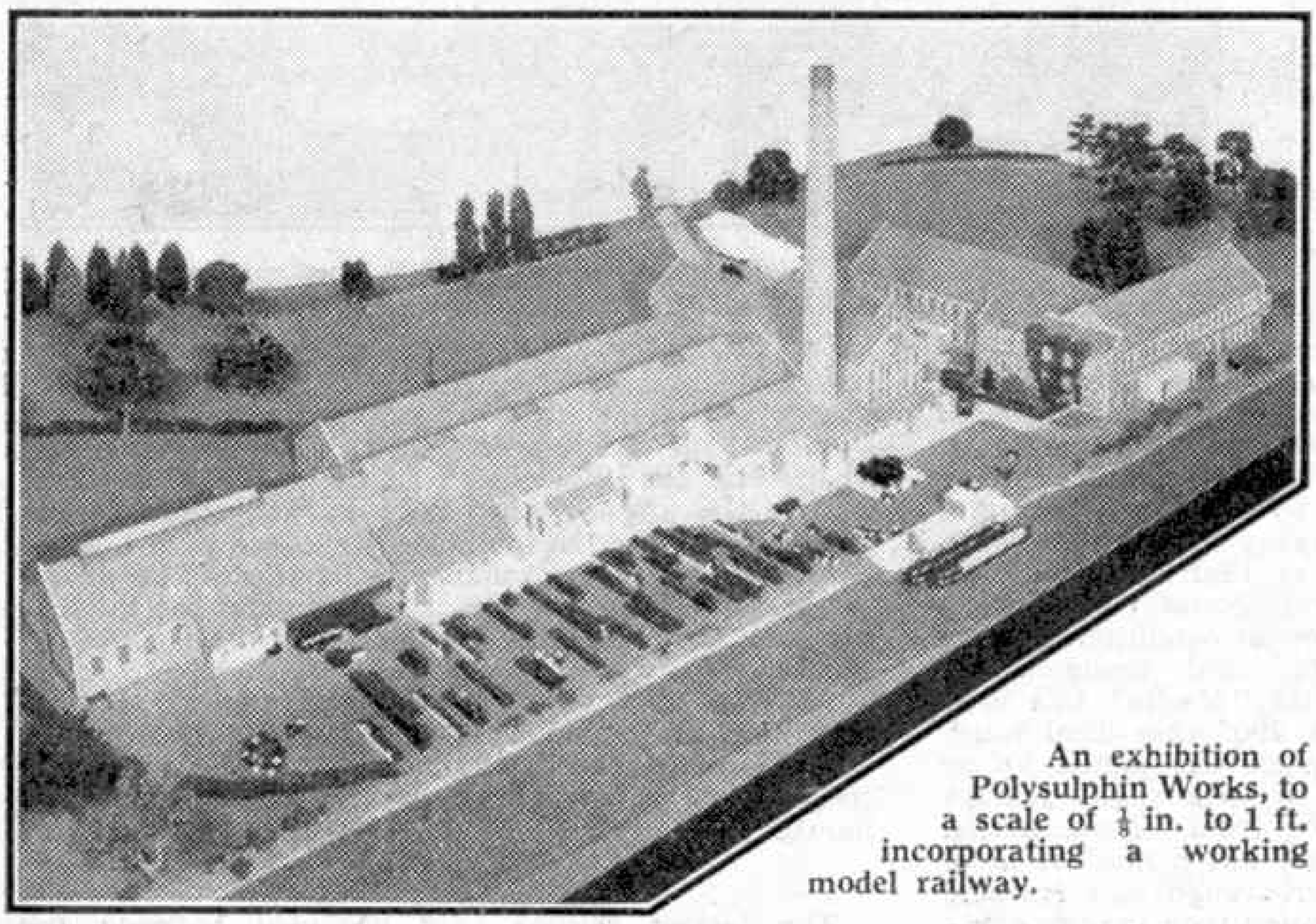
Architectural Modelling

By W. J. Bassett-Lowke, M.I.Loco.E., F.R.S.A.

THE post-war years have led to much increased interest in architecture, owing to the need for the great amount of rebuilding following suspension of such activities and destruction during the war. Architectural design has been of major importance, because of the necessity to build for the needs of an increasing population—houses, schools and other educational establishments, hospitals, factories, warehouses, shops and public buildings.

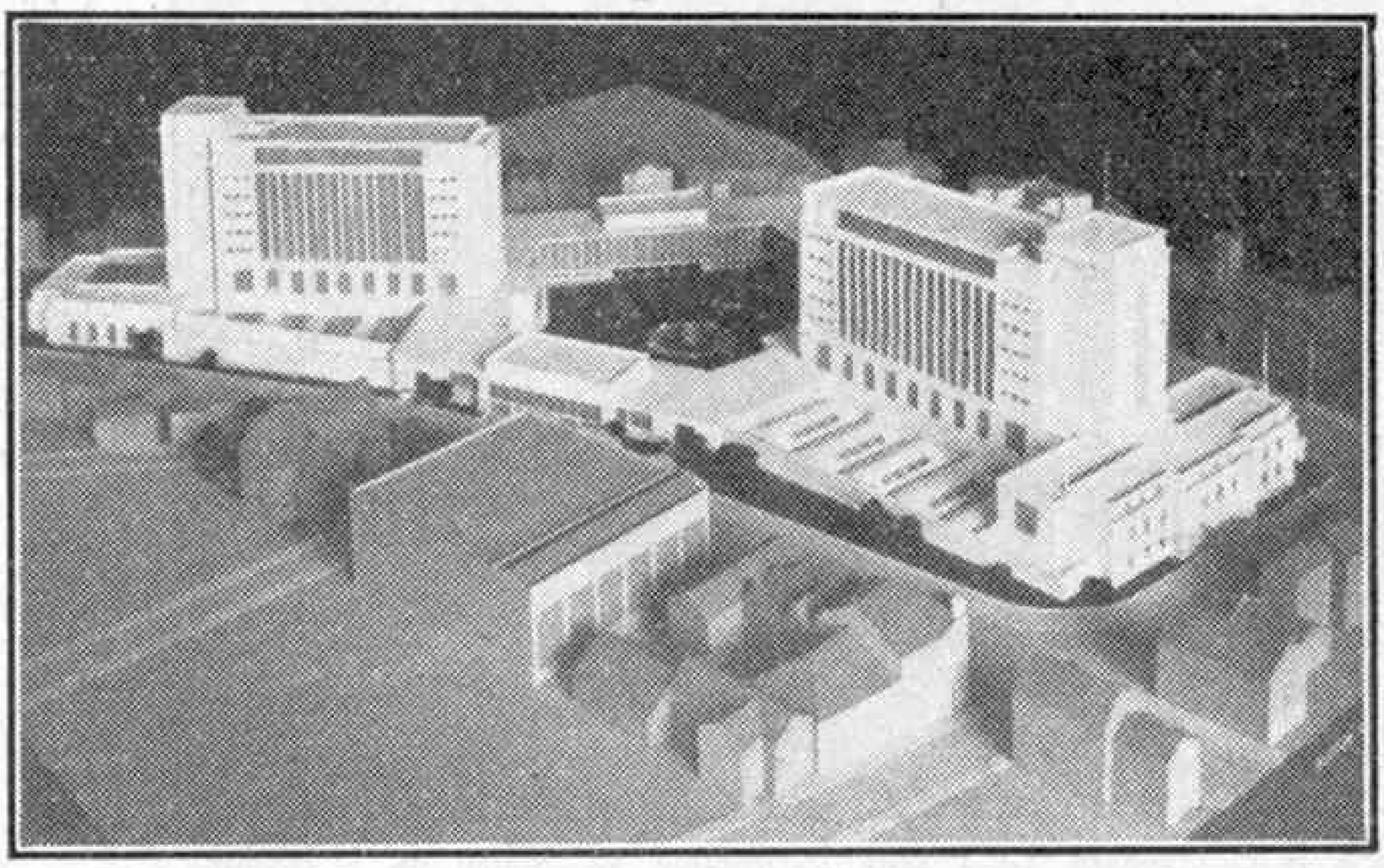
With so much to be done, careful planning is essential, and as a result increased use has been made of architectural models, to give accurate impressions of appearance and layout. By looking at a model the prospective builder or purchaser of a factory, warehouse, etc., can visualise the finished result. Points that are doubtful in plans and drawings can often be cleared up by means of a model.

At the same time, many models of existing buildings are made for exhibitions and to stimulate interest in publicity. The accompanying photographs illustrate some of these different kinds of architectural models, all of which were made by Mr. E. H. Clifton of Northampton, in association with my Company.



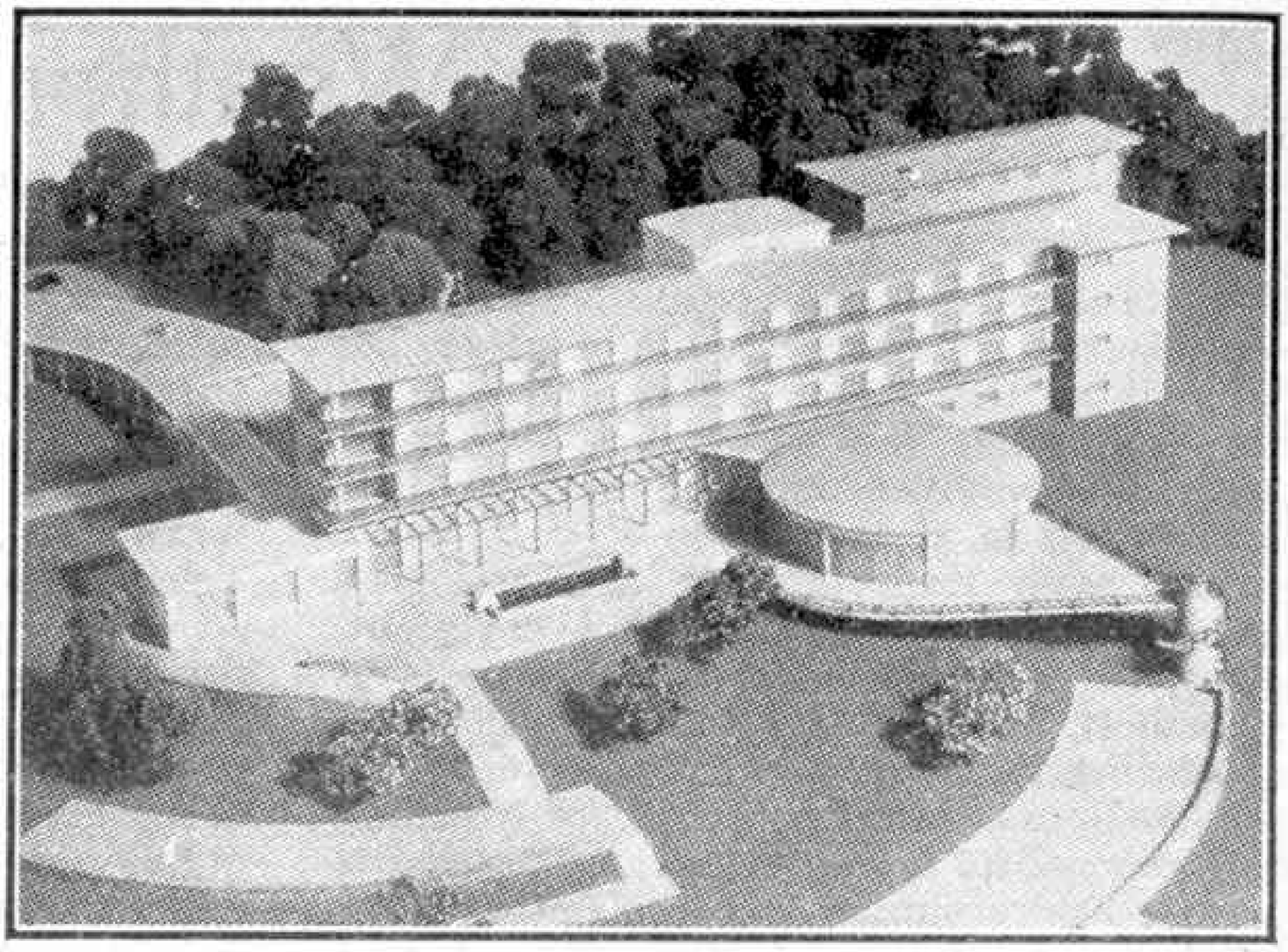
An exhibition of Polysulphin Works, to a scale of $\frac{1}{8}$ in. to 1 ft. incorporating a working model railway.

The Polysulphin Co. Ltd., of Keynsham, near Bristol, manufacturers of liquid soap, etc., had a model of their factory made for the 1950 Laundry Exhibition at Olympia, to display on their exhibition stand. The model, to a scale of $\frac{1}{8}$ in to 1 ft., was unusual in that it incorporated a working model railway and was thus a source of great attraction for visitors. The model measured about 12 ft. by 5 ft. overall and showed, in addition to



Model of a design for rebuilding Nottingham and District Technical College. Scale, 1/16 in. to 1 ft.

the grey, red-roofed factory buildings, an extensive grass surround, with trees, hedges, a hill and the river Avon, which runs alongside the factory. On the river were model barges loaded with steel drums, and more drums were in the factory yard. The electric model gauge 00 train, on a realistically-ballasted track, ran through a tunnel under the hill, went right through the factory and then re-appeared to run in a large circle before re-entering the tunnel. During the Exhibition the train covered a distance of some 54 actual miles, in nine days.



Model of a country hotel, to a scale of 1/16 in. to 1 ft.

The second illustration is concerned with a Nottingham project, a proposal for a new and larger building to replace an existing one. The model, to a scale of $\frac{1}{16}$ in. to 1 ft., was made to the order of Messrs. Cecil Howitt and Partners, to demonstrate their design for re-building the Nottingham and District Technical College. The model of the college building is shown in full detail, with surrounding streets and buildings indicated in block form. If this project could be realised at some future date it would certainly be a magnificent and imposing building, worthy of a fine city.

The last model represents a design for an entirely new building, a suggestion for a country hotel. The model was made for Miss R. Chapman, a student at Liverpool School of Architecture, to illustrate a thesis. Once more a fairly small scale has been used, $\frac{1}{16}$ in. to 1 ft. If a hotel should be built to this design it would be interesting to know the reactions of guests staying there.

Tanker Launched Sideways

The accompanying photograph, taken at Knottingley, Yorkshire. on the banks of the River Aire, shows the tanker *"Teesdale"* of about 550 tons being launched from the Harker shipyards. There it is necessary to launch vessels sideways into the water, because of the narrowness of the waterway.

Assembly of the tanker, and of other vessels of this type built in the yards, is carried out at the waterside from pre-fabricated welded sections, which are built in adjoining sheds. After installation of the engines, no further progress is possible at Knottingley. The reason for this is that there are several low bridges between Knottingley and the sea, under which it is only possible to pass the hulls, even when fully ballasted. All superstructure therefore is fitted farther down the river.

Vessels of this type are used principally for river estuary and coastal work. All boats in the class to which the tanker belongs are named after well-known dales, and also carry the initial H after the name.

G. FIRTH.

The Pilot's Weather Forecast

By C. E. Wallington, B.Sc., F.R.Met.S.

"IT was a wonderful flight." No doubt most passengers voicing such satisfaction realise that the weather has something to do with safety and comfort in flight, but few know how the pilot gets his weather forecast or just how detailed it is.

All main airports have meteorologists on the spot to give advice for every flight. One of the busiest of these airports is Northolt, terminal for flights to Europe, Scandinavia, Spain and the Mediterranean as well as various parts of Britain. Meteorological organisations at all airports are basically similar but the details vary slightly, depending on the area covered by the flights and the types of aircraft used. Northolt forecasts are primarily for short and medium range flights by aircraft which usually fly below 15,000 ft.

Before a forecast can be made the actual weather over a large area must be known. At Northolt observations of the wind, weather, clouds and visibility are made every half hour and the barometric pressure, temperature and humidity are measured every hour. These observations, together with others from hundreds of observers on land stations, ships and aircraft, are collected by teleprinter and wireless at the Meteorological Telecommunications Centre at Dunstable, soon to be edited and redistributed to meteorologists throughout the northern continents. Such a high speed exchange of information would be impossible if every observer sent out a detailed report in his own language. So an international code or shorthand is used. In this code each report consists of a few groups of five figures. At first sight the code may appear complicated but experienced meteorologists talk and even think in terms of it.

However, the teleprinter messages are only the raw material with which the weather picture must be built up. Every three hours plotters transpose the reports on to large charts, again using an international system, and soon the weather from mid-Atlantic to Russia and from Iceland to North Africa is accurately mapped.

While the weather map is being plotted other assistants are preparing charts and graphs showing the high level winds, pressures, temperatures and humidities measured at special stations and ships, where gas filled balloons carrying meteorological instruments and miniature radio transmitters are sent high up into the stratosphere at regular intervals.

The charts are then passed to the senior forecaster who now tries to fit all the evidence before him into a sort of three dimensional weather pattern. He draws isobars, or lines joining places of equal barometric pressure, and labels the depressions (low pressure areas) and anticyclones (high pressure areas). Then, having studied the movement and development of the various weather systems, he supervises the general forecasting and sends out hourly "Landing Forecasts" of the local weather to all other airports likely to send aircraft to Northolt. Frequently the forecaster discusses his theories with his colleagues at London Airport and advice is always available at the Central Forecast Office, Dunstable, where some of the country's

Fig. 1. A section of the weather map showing some Norwegian weather reports plotted in the international system. In practice some of the symbols and figures are plotted in red and some in black.

2

FLIGHT FORECAST

ROUTE NORTHOLT TO NICE TRACK Normal

VALID FROM 07.10 UNTIL 10.40 G.M.T. ——— 195—

ZONE	NORTHOLT to 47½° North	47½°N. to 45°N.	45°N. to NICE
TIME	07.10 to 08.40 G.M.T.	08.40 to 09.40	09.40 to 10.40

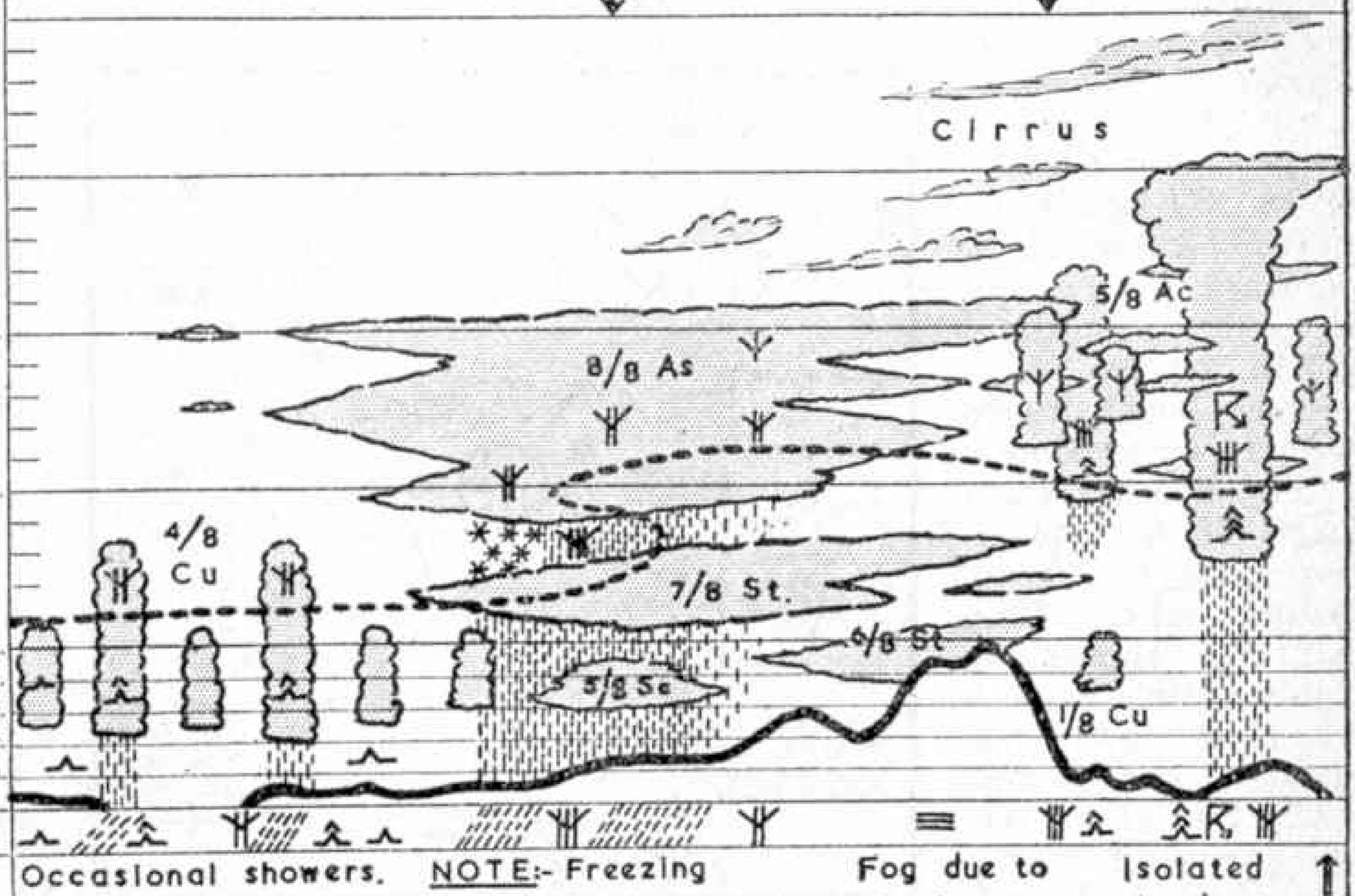
SYMBOLS

RAIN or DRIZZLE
SNOW
FOG
HAIL
THUNDERSTORM
LIGHT ICING
MODERATE ICING
SEVERE ICING
LIGHT TURBULENCE
MODERATE TURBULENCE
SEVERE TURBULENCE

ABBREVIATIONS

OCC = OCCASIONALLY
BEC = BECOMING
PPN = PRECIPITATION
INT = INTERMITTENT
CON = CONTINUOUS
MOD = MODERATE
VAR = VARIABLE

30,000 ft.
25,000 ft.
20,000 ft.
15,000 ft.
10,000 ft.
5,000 ft.
4,000 ft.
3,000 ft.
2,000 ft.
1,000 ft.
M.S.L.



SIGNIFICANT WEATHER	Occasional showers. NORTHOLT	NOTE:- Freezing rain between 7,000 and 9,000 ft.	Fog due to cloud covering hills.	Isolated thunderstorms NICE
REMARKS				
BASE OF LOW CLOUD (IN FEET ABOVE M.S.L.) ...	2,500 feet	3,000 feet		3,000 feet.
SURFACE VISIBILITY ...	12 miles	3 mls. bec. 400 yds. in hill fog.		15 miles
M.S.L. PRESSURE (MILLIBARS)	1007	1012		1014

WIND DIRECTION (°TRUE), WIND SPEED (KNOTS) AND TEMPERATURES (°C)

2,000 feet	320 degrees 20 knots +8°C.	280° 10 knots +13°C.	320° 10 kts, +14°C.
feet			
5,000 feet	310° 25 +2°C.	280° 15 +10°C.	290° 10 +10°C.
feet			
10,000 feet	300° 40 -8°C.	300° 20 +2°C.	300° 20 0°C.
feet			
15,000 feet	300° 55 -17°C.	310° 30 -9°C.	330° 25 -11°C.

METEOROLOGICAL OFFICE NORTHOLT ISSUED AT 06.10 HOURS ——— 195—

Fig. 2. Part of a typical pictorial forecast to Nice. In practice cloud below the freezing level is shaded green and cloud above is shaded red.

top ranking meteorologists study the weather situation on a grander scale.

Meanwhile other meteorologists at Northolt are preparing forecasts for each flight. The Captain of each aircraft comes for a preliminary discussion about one and a half hours before he is due to take off. On the strength of this advice he announces his decision to take off on schedule, or to delay, and whether or not he needs extra fuel put on his aircraft. The main question is whether conditions will be suitable for landing at his destination, for even with modern radio aids very low clouds and fog can be dangerous. Hence he studies the Landing Forecasts which are sent out from the destination in the same way as the senior forecaster sends out his forecasts for Northolt. Next, take-off conditions and weather on route are considered. Very dense fog may delay the departure or storms may present flying hazards.

However, assuming the Captain decides

to leave on schedule, his forecast is completed and half an hour later he returns to discuss it in detail. Possible dangers are pointed out; flying heights at which he may avoid icing conditions or head winds are recommended and alternative landing places are suggested in case the weather at the destination proves to be hazardous towards the time of arrival. For a short flight the pilot is given a written forecast but if he is going more than 500 miles the meteorologist draws a pictorial version.

Fig. 2 shows what part of a typical forecast to Nice looks like. The picture shows a schematic cross-section of the weather and clouds likely to be encountered. The heavy wavy line at the bottom shows the level of high ground on or near the route. Notice where it rises to about 5,000 ft. That represents a section of the French Central Massif. The freezing level (the level at which the temperature drops to 32°F., or 0°C.) is normally marked in green but in the diagram it is shown as a heavy broken line. The amount of cloud expected at various stages en route is always given in eighths of the sky covered while the type is denoted by abbreviations, e.g. "8/8 As" means that the sky is completely covered with Alto-stratus cloud. Other important items such as the weather, icing conditions and turbulence, or roughness of the air, are represented by the international symbols shown. The key is on the left of the picture. For convenience, the route is split up into zones and additional information is written below the picture. The Mean Sea Level barometric pressure gives the pilot some idea of how much he will have to adjust his altimeter in flight. The winds are used for navigation.

Consider how a Captain would plan his flight on this forecast. In the first zone, flight at low levels would be safe but uncomfortable for the passengers. Notice the turbulence symbols in and below the cloud. It would be better to fly just above the low clouds and avoid the larger ones which are giving the showers since there are moderate icing conditions in them. To conform with international flight regulations the Captain would choose either 7,500 ft. or 9,500 ft.; 6,500 ft. and 8,500 ft. being reserved for aircraft flying northwards in this region. Towards the end of the zone he would note the snow above the freezing level and, what is more important, the severe icing symbol marked in the rain. This is due to those twists in the freezing level and the area must be avoided at all costs. Now, unless he were flying a pressurised aircraft equipped with oxygen, his best plan would be to descend below the freezing level while flying through the rain. Then, after obtaining permission from the appropriate Air Traffic Control Centre, the radio signal box of the airways, he would probably climb up through the 7/8 St (Stratus) and fly at 9,500 ft. between the layers of cloud. At this level he would be well above the Massif and be able to see clearly all around him.

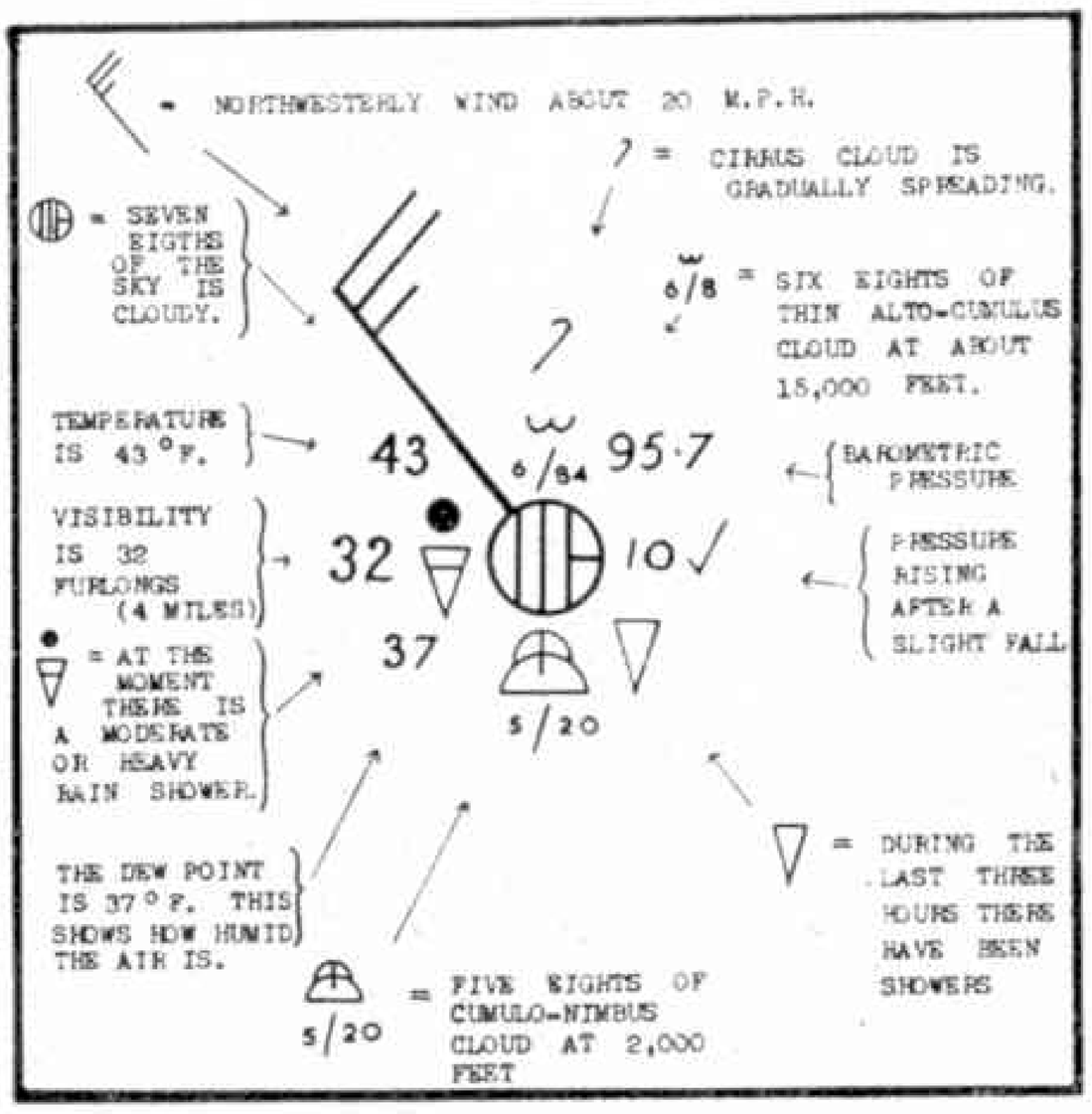

= NORTHWESTERLY WIND ABOUT 20 M.P.H.
= CIRRUS CLOUD IS GRADUALLY SPREADING.
= SEVEN EIGHTHS OF THE SKY IS CLOUDY.
6/8 = SIX EIGHTS OF THIN ALTO-CUMULUS CLOUD AT ABOUT 15,000 FEET.
TEMPERATURE IS 43°F.
43
6/84
95·7
BAROMETRIC PRESSURE
VISIBILITY IS 32 FURLONGS (4 MILES)
32
10
PRESSURE RISING AFTER A SLIGHT FALL
= AT THE MOMENT THERE IS A MODERATE OR HEAVY RAIN SHOWER.
37
5/20
THE DEW POINT IS 37°F. THIS SHOWS HOW HUMID THE AIR IS.
= DURING THE LAST THREE HOURS THERE HAVE BEEN SHOWERS
5/20
= FIVE EIGHTS OF CUMULO-NIMBUS CLOUD AT 2,000 FEET

Fig. 3. A close-up of the Stavanger report showing how much information can be packed into a small space. It takes about 20 seconds to plot each complete station report.

On entering the last zone it would be advisable to descend again to 7,500 ft. or below in order to keep clear of the thunder-clouds. However, having been warned of these isolated but dangerous storms, the pilot should have no difficulty in this last zone.

During flight latest Landing Forecasts and additional weather information can be obtained from various Air Traffic Control Centres. Also the Radio Officer transmits the Captain's own weather reports, whenever necessary, for the benefit of meteorologists on the ground and other aircraft flying in the vicinity.

Finally, on reaching his destination each pilot goes to the Meteorological office to describe the weather encountered, thus adding to the flow of observations on which more forecasts will be based.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With certain exceptions, which will be indicated, these should be ordered through a bookseller.

"THE BOYS' BOOK OF SOCCER 1952"

Edited by PATRICK PRINGLE
(Evans Bros. Ltd. 10/6)

Once again the time has come for the appearance of this well-known Annual. As usual it contains articles on famous clubs and players, outstanding international and cup games of the past, playing hints and suggestions, and other topics connected with the game. In addition there are stories, puzzles and quizzes, and altogether the book provides a wealth of good things for all who are interested.

The illustrations are an attractive feaure of this Annual. The present volume includes five colour plates featuring famous footballers, with a very large number of photographs of exciting incidents on the field of play, cartoons, and crossword puzzles of football interest.

"OUR FOOD AND OUR CLOTHES"

By H. ALNWICK
(Harrap. 8/6)

This is described as a new geography book, but it is a long way removed from the traditional volume of this kind. It is indeed a cheerful and attractive account of the way in which we get not only our food and our clothing, but also many other things. The presentation is graphic, with an abundance of little pictures, many of them humorous in style and in themselves conveying a mine of information.

The book begins with pithy accounts of chocolate, bananas and similar products, and gradually becomes more serious with butter and margarine, fish, breads—the variety of these will astonish many young readers—watermills, Christmas trees, cotton, meat and so on. Tables of production, and drawings and maps complete a fascinating and informative book.

"COLLECTING AND BREEDING BUTTERFLIES AND MOTHS"

By BRIAN WORTHINGTON-STUART, F.R.E.S.
(Warne. 10/6 net)

This addition to the Warne series of books on natural history is a practical one. It does not describe or illustrate butterflies and moths, but gives full directions for collecting these insects for display and for breeding.

The equipment to be used is well described and the author gives readers full benefit of his own long experience in dealing with the specimens when they are caught. The importance of recording is emphasised and collectors are warned particularly not just to capture large numbers of well-known insects to form a large collection, nor to kill thoughtlessly the rarer butterflies or moths they encounter. These are better left to breed in the open, to prevent their species from disappearing altogether, unless of course they are captured for breeding in captivity.

The book is well illustrated, with a coloured frontispiece and a series of line drawings in the text.

"ELECTRIC CONTROL OF CLOCKWORK RAILWAYS"

By ERNEST F. CARTER
(Percival Marshall and Co. Ltd. 3/-)

The clockwork miniature locomotive is usually criticised because, except for braking and reversing, it is virtually uncontrolled once it has been put in motion. How to provide this control, with further electrical refinements, is the subject of Mr. E. F. Carter's book, in which he shows his usual practical thoroughness. In it he provides ample material for the clockwork owner in search of improvement, and his effort will appeal particularly to miniature railwaymen who enjoy experimental work.

THE GOLDEN VOICE RECORD BOOKS

(Publicity Products. 4/6 each)

These record books are well named. Each contains a story, some written by Jean Sutcliffe, who directs the B.B.C. "Listen with Mother" programme, with a gramophone record tucked into the cover with the aid of which the story itself can be heard as told by Julia Lang, a "Listen with Mother" broadcaster, to the accompaniment of appropriate music and song.

From this it will have been gathered that the books are intended for children between the ages of 5 and 10, a group that includes the youngest *"M.M."* readers. They are well printed, with large size type and amusing pictures, and the records included with them are excellent. These measure 7 in. across. Although they are of the longer playing type their speed is 78 r.p.m. and they can be played on any gramophone with this standard arrangement.

Among the stories included in the series at present are *"The Three Bears," "Cinderella," "Jack and the Beanstalk"* and *"Alice's Adventures in Wonderland,"* and other less familiar tales are *"Henny-Penny"* and *"The Lost Toys."* Books and records alike will give the greatest pleasure to those of our readers who still enjoy such stories, and we suspect that many of their parents also will enjoy the records, with their clever presentation, as much as those for whom they are supposed to be designed.

"MODELS IN BOTTLES"

By R. F. C. BARTLEY
(Percival Marshall. 7/6 net)

There must be few readers who have not seen "ships in bottles" and have not wondered how these astonishing vessels got there. Mr. Bartley has now gone a step further and has worked out methods of bottling almost any subject. Here we find pictures of windmills, stage coaches and old buildings proudly displayed inside bottles into which they could not enter by ordinary means, and there are even details of a model man building a model ship, both inside a bottle through the neck of which neither could be squeezed.

The field for model bottling indeed has suddenly become unlimited, and all who are interested in this intriguing hobby will welcome the author's account of his new sectional system, which is accompanied by excellent sketches.

"THE STAR KINGS"

By EDMOND HAMILTON
(Museum Press. 8/6)

With the prospect of travel through space now opening up before us, it is not surprising that stories in which such voyages play a great part are making their appearance. *"The Star Kings"* is a romance of this type that plunges us into the great Star Kingdoms of 2,000 centuries hence.

A New York clerk of to-day who has changed bodies with a prince of the Mid-Galactic Empire of those times has scarcely been able to accustom himself to the immensely strange conditions of life of this world of the future before he finds himself taking part in an exciting series of adventures. These are encountered in the course of a great war between the Empire and the Dark Worlds, in which armies travel through space from one galaxy to another and fight with strange weapons. There are many complications, but in the end the issue is decided in favour of the Empire by the use of a dreadful secret weapon—and the clerk returns to present-day New York.

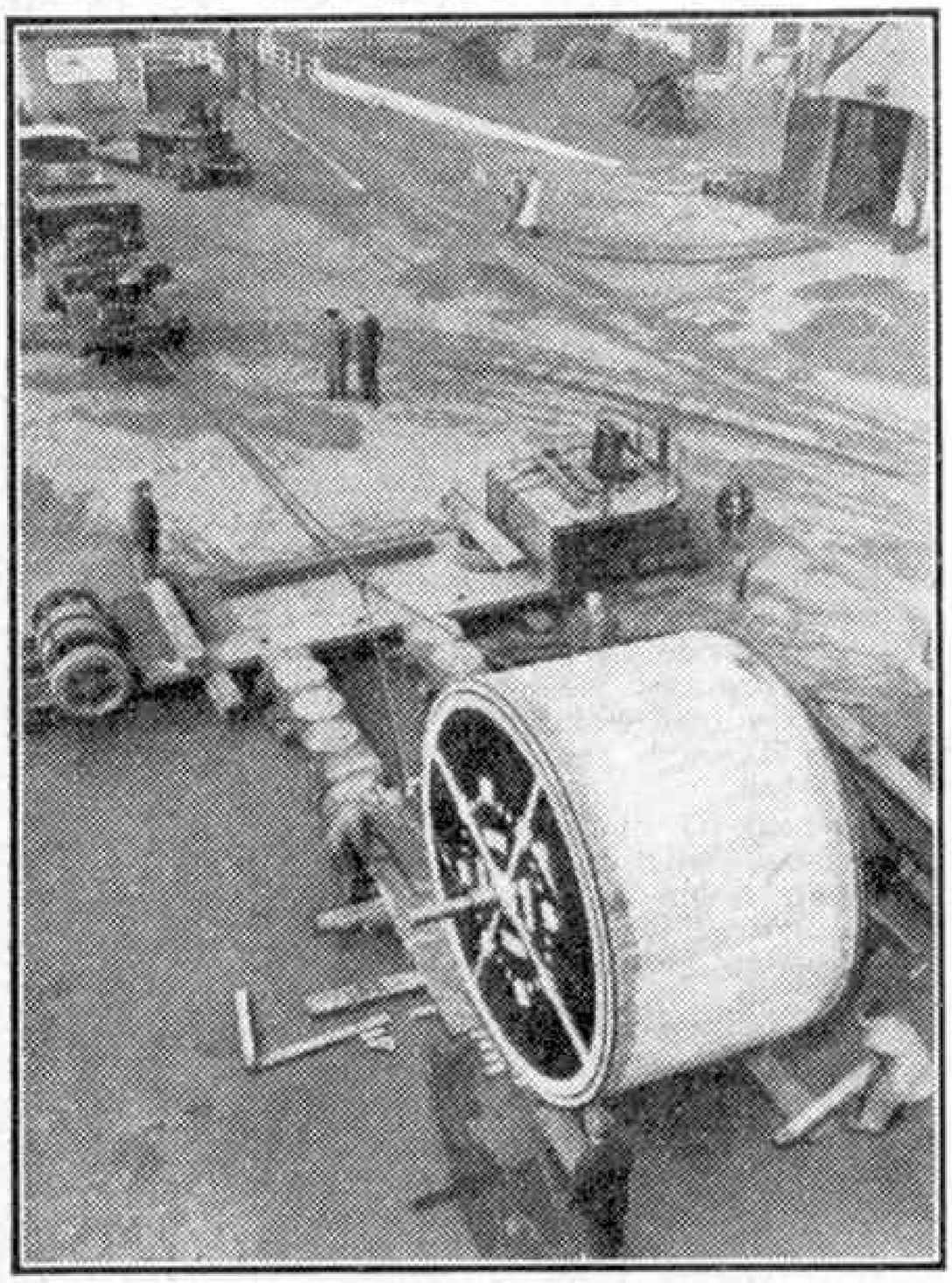
This piece of science fiction is well told, and is full of strange adventures placed in a new and thrilling universe.

World's Largest Cable Drums

Laying 33,000v. Underwater Power Lines at Fleetwood

WHEN it was decided to lay 33,000 volt cables across the Wyre Estuary at Fleetwood, Lancashire, it was realised that the project would be an outstanding one. The cables, two in number, were required for connecting the existing 6,600 volt supply on the site of the new generating station at Fleetwood to an overhead line at Preesall on the opposite bank of the Estuary. The voltage will be stepped up to 33,000 when the Fleetwood Power Station is completed, and the supply will then meet the needs of consumers in the Preesall neighbourhood.

The first point that made the scheme outstanding was the length of the power cables to be used. The stretch across the Estuary to be covered was 1,050 yards long, and there were to be no joints under water. For this reason the cables were made by British Insulated Callender's Cables Limited in two single lengths of 1,130 yards each. They were three-core cables, paper insulated and lead-alloy sheathed, with single wire armour. A single-core armoured auxiliary cable was also made for laying across the Wyre Estuary.



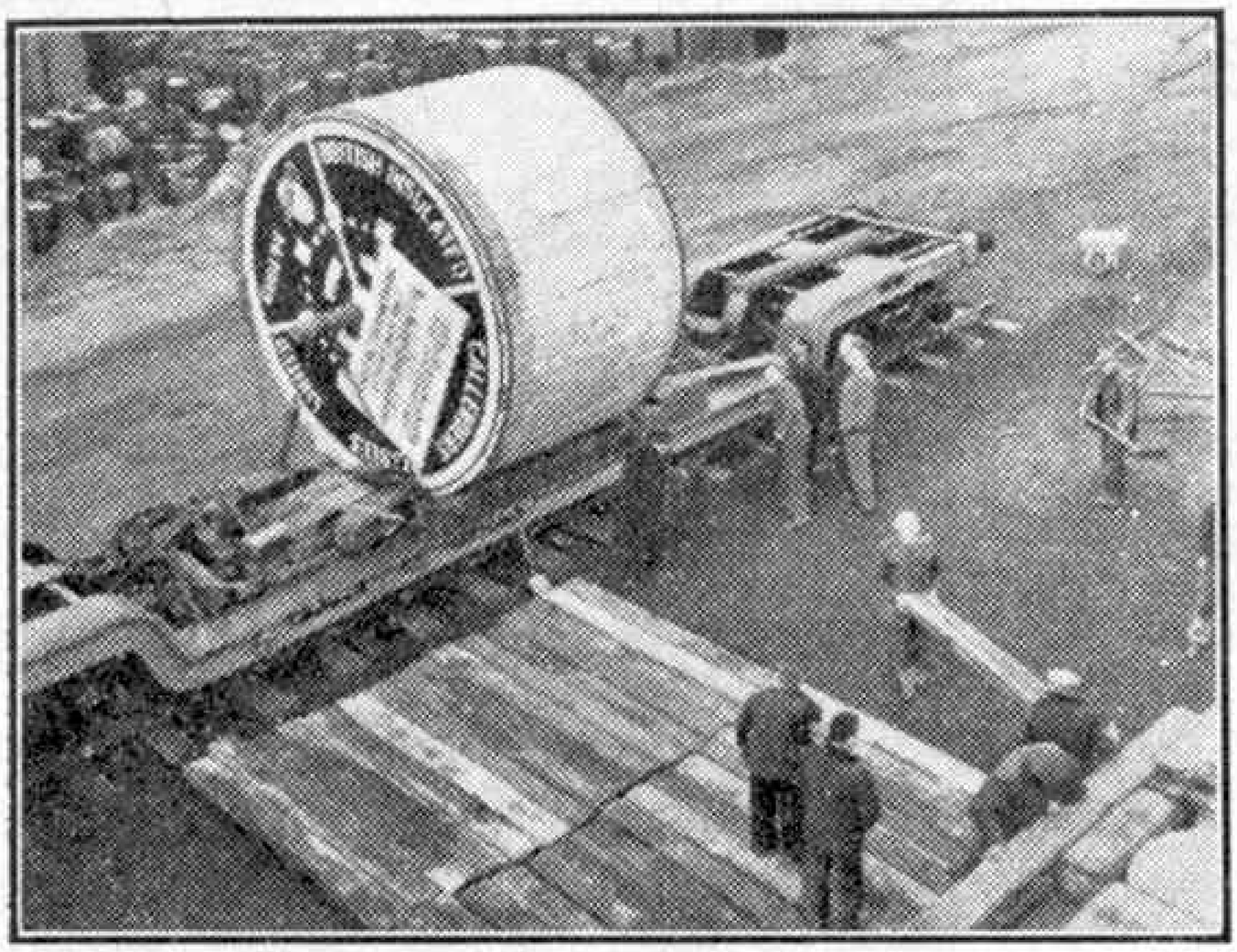
Diesel lorries hauling one of the world's largest drums, on which a 1,130 yd. cable was wound, on to an eight-wheel trailer for transport by road to Fleetwood. The illustrations to this article are reproduced by courtesy of British Insulated Callender's Cables Limited

A special feature that made the cable crossing unique was that the great lengths of the two three-core cables made it necessary to build exceptionally large drums to hold them, and indeed those constructed are believed to be the largest ever built. They were 12 ft. in diameter and 8 ft. in width, and the total weight of each with its cables was 36 tons.

The cables were made at the Erith Works of British Insulated Callender's Cables Limited, and transporting them from these Works, on the south bank of the Thames, near Woolwich, to the banks of the Wyre was a task that required special arrangements. Two diesel lorries with 8-wheel trailers were used. Each drum in turn was hauled up a ramp on to its trailer by the two diesel lorries pulling together, as shown in one of our illustrations. When the two drums had been securely mounted in this way the lorries with their trailers set off on their 250-mile journey. The size of the loads made it necessary to provide a special Police motor cycle escort for the convoy, which moved steadily northward at a maximum speed of 5 m.p.h., the journey taking four days to complete. On one hilly part of the route rain made the surface so slippery that the two lorries were coupled in tandem to pull each trailer up the hill in turn.

For the last lap of the journey it was necessary to transfer the drums to a railway trolley wagon. For this purpose a temporary railway siding was laid down and a wooden platform was improvised so that the trailer could be brought alongside the railway wagon, with both vehicles at the same level. Then, in turn, the drums were wheeled from the road trailers to the wagons.

Another feature that made this installation outstanding was the manner in which the cables were laid. Usually underwater laying is done from a specially equipped barge, but in the difficult tides of the Wyre Estuary this was impossible, and instead the cables were pulled across



From the road trailers the drums were rolled over a wooden platform by a temporary siding on to railway wagons, on which their journey was completed.

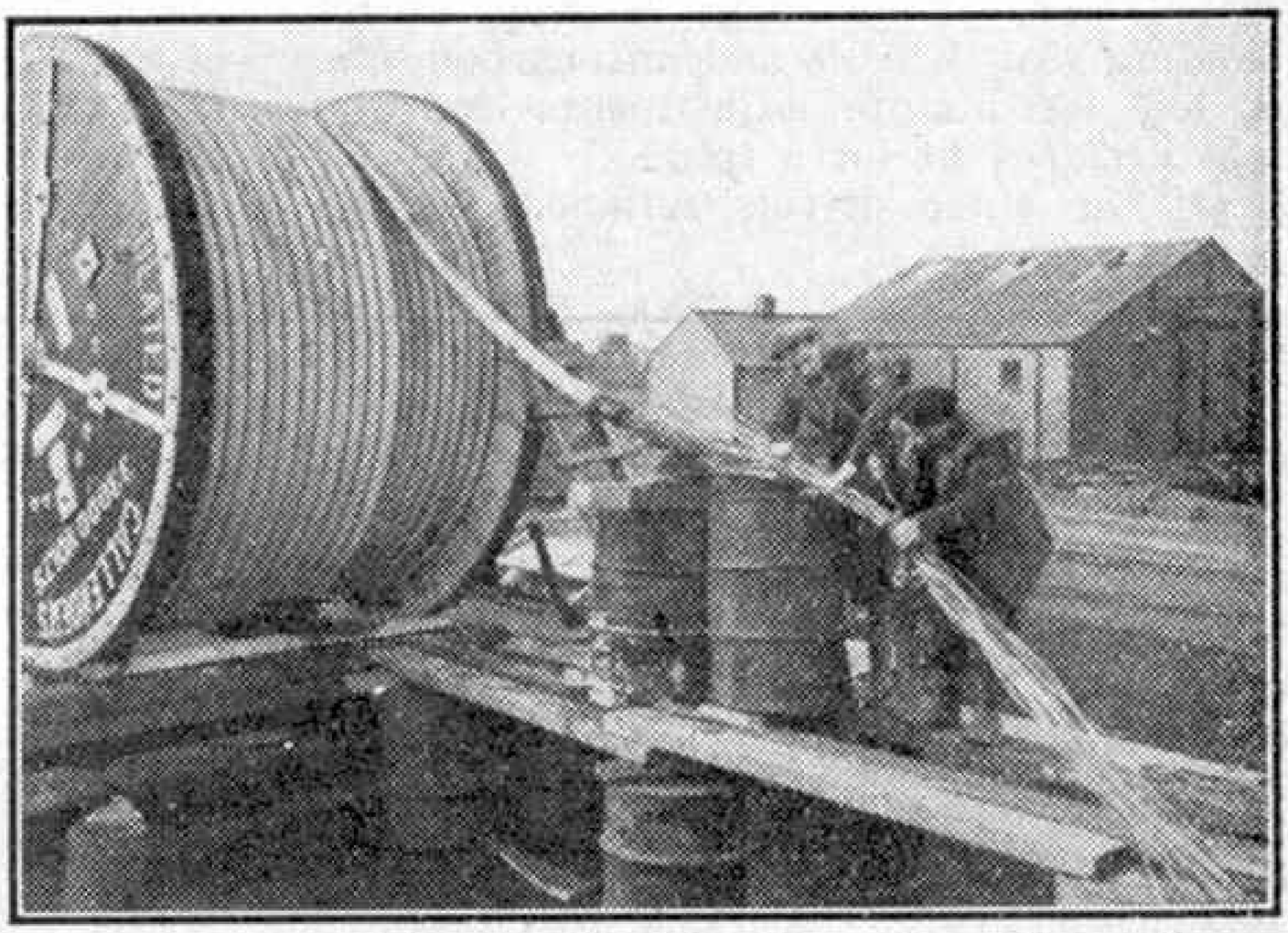
by winches on the Preesall side. The idea was to haul them across, floating on oil drums, during a neap tide period, so as to take advantage of slacker water. At neap tide more than half the Estuary is flooded at low water, but not then to an extent that would allow the cable to be floated, so it was necessary to work at high water.

The first step was to prepare the sites for the two cables, which were laid down at a distance of 50 ft. apart. Across the river channel itself the cables were to be laid at a minimum depth in its bed of 1 ft., while over the remainder of the Estuary crossing a depth of 3 ft. was specified. Trenches therefore had to be carved out of the hard clay river bed. This was done by blasting, the charges of explosive being laid in a string along the line of the trench. The charges were of the plaster type, and for this operation were laid on the river bed and not sunk in it. They were fired electrically, in lengths of about 50 yards at a time, when there was a sufficient depth of water over them, and soundings were then made to make sure that the blasting had been effective.

In the meantime trenches had been excavated on the Preesall side of the river and winches installed at the shore end of these. The wire bond for pulling the first cable was hauled across by rowing boat and attached to the upstream winch.

The pulling operation began about 3 hours before high tide. On the previous day about 250 yards of the first cable had been pulled out towards the water's edge in readiness. The oil drum floats were attached to the cable at 9 ft. intervals as it was hauled from the bank on the Fleetwood side, and the Preesall bank was reached in about 3½ hours. The floats were removed as the cable grounded. As the period of slack water was short the cable could not be placed exactly on line, and it was moved to its correct position in subsequent operations.

Across the mud flats progressive lengths of trench were dug out for the cable and the soil filled back over it during periods of low tide. This lining up and bedding in of the cable was seriously hindered by rainstorms and severe gales, with wind speeds of up to 80 m.p.h. As a result it was impossible to begin laying a second cable at the next neap tide, and it was agreed to pull it across the Estuary on rollers at low water during the spring tide period. This task was successfully accomplished within three hours, the cable being taken across at a speed of about 20 ft. per minute. The auxiliary cable was similarly installed two days later.



A cable drum in position ready for the pulling of the cable itself across the Wyre Estuary. The cable end is being spliced to the block to which a hawser was later attached for hauling the cable across.

A Trip on a "Trial Engine"

By "W-U1"

IN the course of my apprenticeship with the former L.N.E.R. at Doncaster, I made several trips with "Trial Engines," that is, engines being given a preliminary trial run after having been through the shops. Such runs give any faults a chance to show themselves before the engine goes back into traffic and form a useful and instructive means of increasing one's locomotive experience. On them I travelled on *"Quicksilver," "Silver King," "Commonwealth of Australia," "Dominion of New Zealand,"* and many others. One trip on a Gresley "Pacific," then No. 45, *"Lemberg,"* can be taken as typical.

So to *"Lemberg"* in all the original splendour of L.N.E.R. green standing at the Weigh House, starting point of all such trials. On the weigh bridge the weight on any individual wheel can be read off at a glance. *"Lemberg"* was moved into the Weigh House, weighed off, then moved outside to wait until her steam pressure had built up.

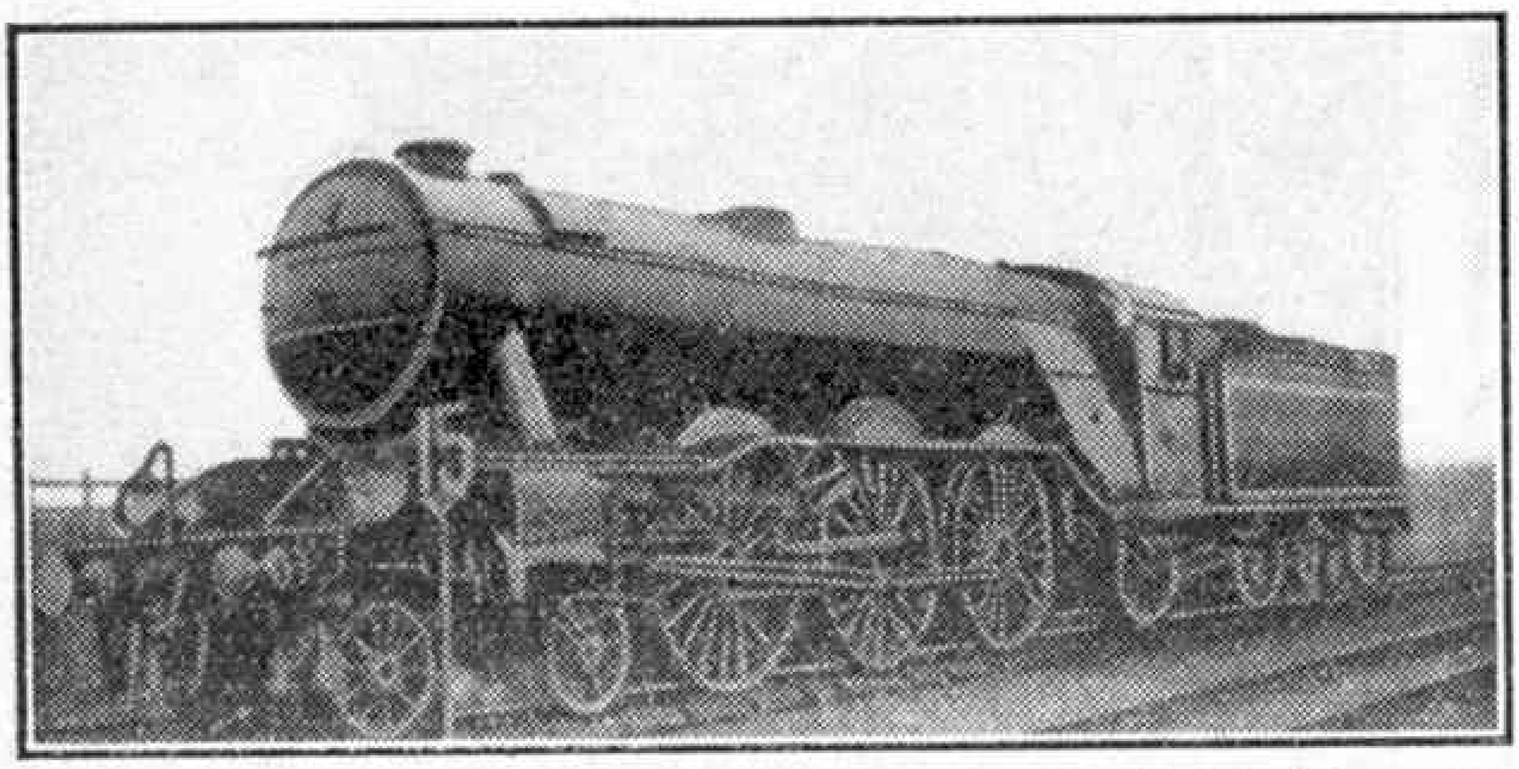
With the "clock" showing around 180 lb. per sq. in., the vacuum ejectors were tested. With a 21 in. vacuum maintained, the vacuum pipes were tested for leaks. Then came the two injectors—two essentials. The exhaust steam injector had to be cleared out before it would pick up properly. Other steam-operated items tested were the carriage heating, steam sanding gear, whistle and anti-carbonisers. A few last-minute adjustments and she was declared fit for a trial.

Of the three drivers retained for the purpose, our driver was J. Tacey, a man of some 40 years' railway experience, some of it main line. The remainder of the crew that day consisted of Fireman L. Hathaway, Fitter F. Surtees and myself. Maximum cut-off in back gear, a scream from the whistle and Driver Tacey eased open the regulator. With steam hissing viciously from the "taps," or cylinder cocks, we slowly moved down the yard.

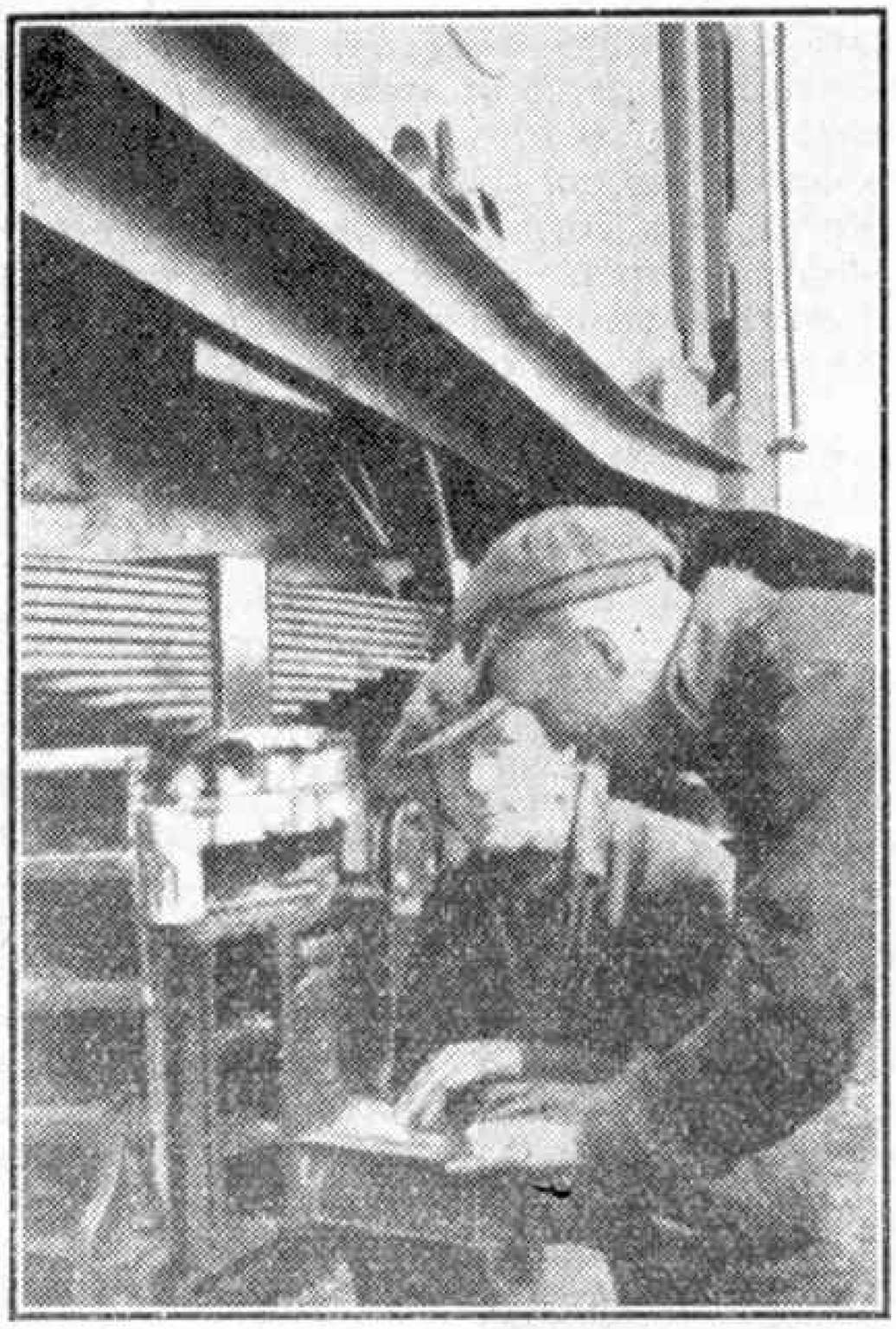
The crew on a trial run with streamlined 4-6-2 "Silver King." The Author is standing on the left of the picture.

Outside the Plant Works we filled up our tank with the full 5,000 gallons. At Marshgate Junction we eventually reached the main line and we came back in reverse, to *"Carr Loco."* as the Doncaster engine shed is known. Once there we took on coal from the mechanical coaling plant, and then turned the engine on the triangular layout. As we passed Carr box Fireman Hathaway called out to the signalman: *"Barkston —Trial."*

With the regulator just



Gresley 4-6-2 "Lemberg" at Barkston on the run described in this article.



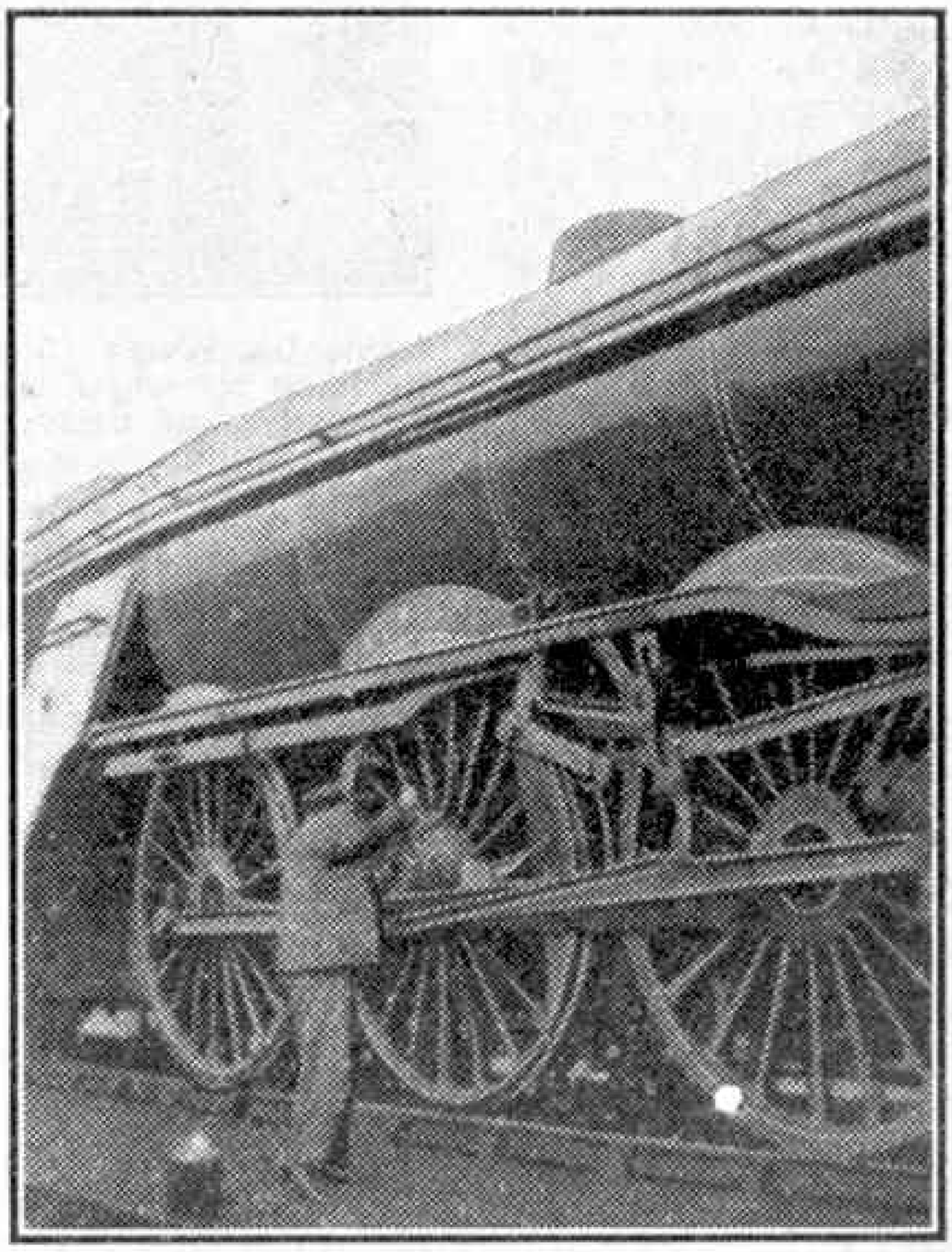
A warm trailing axle box being dealt with by the shop staff carried on a trial run.

open we set off on the first stage of our journey. On the outward trip speed is usually 20–25 m.p.h. and we ambled out towards Rossington, with *"Lemberg"* running very easily. The top nut joint of the right-hand steam pipe on the injector clack-box required tightening; when the injector was working, steam and water came out. So it was tightened up and a cloth wrapped round it. A small blowhole appeared in the steam sand pipe; that would have to wait.

By now we had reached Bawtry, our first stop for examination. All axle boxes were cool, except the right-hand driving box, which was reasonably warm. Over Scrooby Troughs the water scoop or "dip" was tried out and as water consumption had been very light, the tank soon filled up. The scoop was withdrawn with the ratchet clicking quite happily. A wisp of steam from inside the front end led us to suspect a blow on the middle piston gland. North of Retford station a signal stop gave the opportunity to make another inspection. The right-hand driving box had become much warmer.

After Retford we loped up Gamston bank, 1 in 200, in quiet but firm style. Still climbing, we entered Askham Tunnel and we were eventually stopped at Egmanton signal box. *"Right-oh, Frank"* said Driver Tacey, *"we'll have a look at that box."* The three of us clambered down to inspect her, and as before, everything was passable except that box. Working my way inside, I found the middle big end to be quite cool; the small end was warm, due to the blowing gland and joint. Evidence of this blow was shown by the amount of oil sprayed over the crosshead. When I came out it had been decided to drop the wedge on the offending box. Now that the box was hot, the initial clearance had diminished, due to expansion. This clearance had to be restored, and Fitter Surtees went inside armed with the appropriate weapons to do it justice.

Later we were allowed out on the main line to continue our journey and with ten miles to go the experienced ear of Driver Tacey detected a slight groaning sound from the right-hand piston rod. This meant lack of proper lubrication, and a signal check at Claypole afforded us the chance of a quick survey. The right driving box was by now well and truly hot, a situation none of us could completely understand; any other time such a heat would have caused the white metal to run out. The right-hand piston rod was uncommonly dry but we should be safe

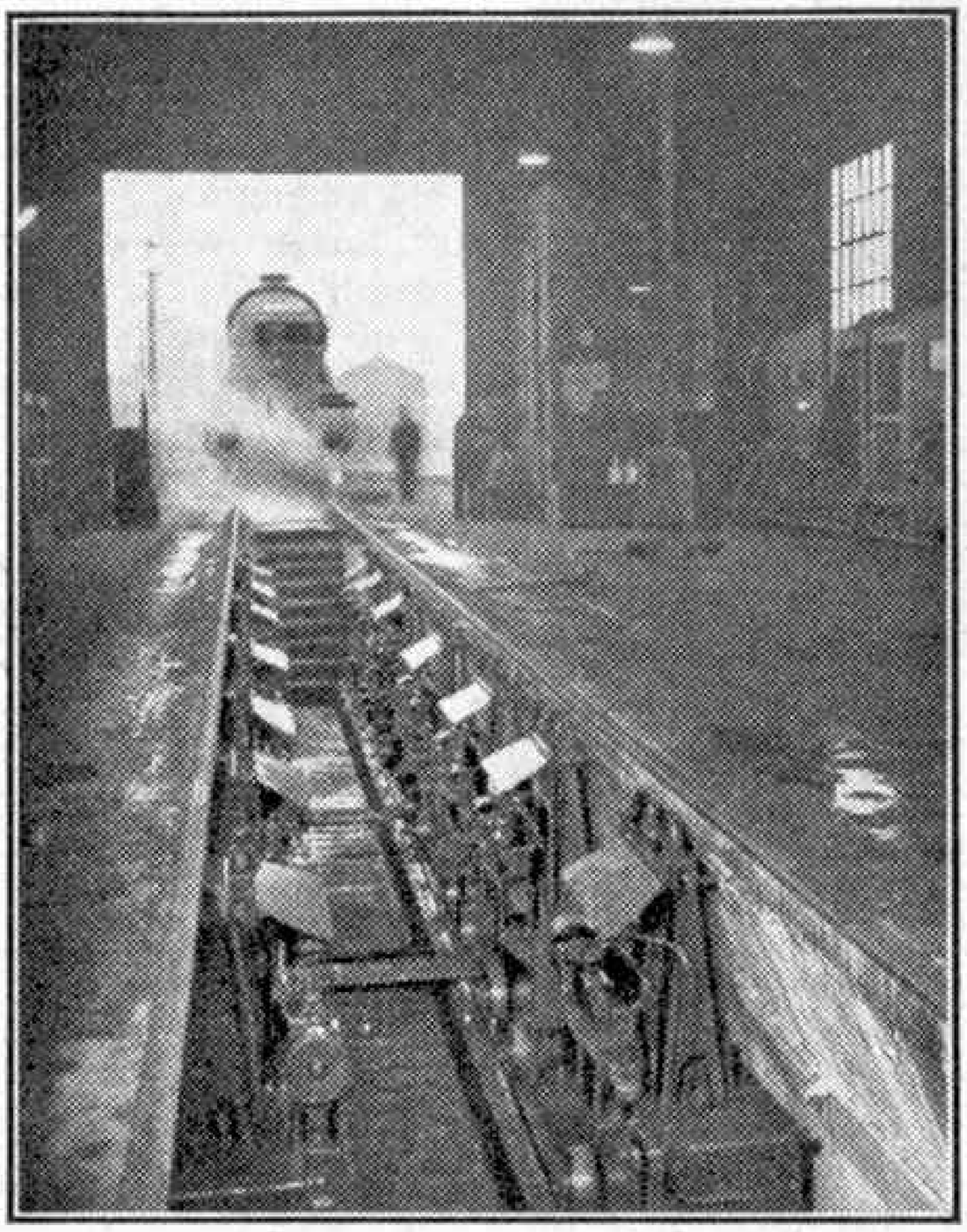


Driver Tacey humours "Lemberg's" heated axle box by pumping in cold oil.

to Barkston, then only about five miles distant.

At Barkston, the usual terminus for trial engines from Doncaster, there is a very large double track triangle. On Sundays, Barkston East Box is usually closed and then the engines proceed to Grantham. Negotiating the triangle we stopped when well clear of all points controlled by Barkston East.

All axle boxes, crank pins, crossheads, big and small ends were examined. Everything was quite passable except the right driving box. The oil in the reservoir well in the top of the box was still there indicating that the metal was still in. Fitter Surtees and myself were fairly new to the job and we were quite prepared to leave it to Driver Tacey. He removed the hot oil and filled up with cold and then pumped oil through the box by means of a hand syringe. A little attention now might save a great deal of trouble later. If that box "dropped its metal" that meant that when she arrived back at Works she would have to be lifted to renew the bearing metal. That entails stripping the motion, part of the brake gear and possibly machining of the axle; all of which would mean loss of time in traffic.



Inside the Weigh House at Doncaster, showing the weighing pit where the weight on each wheel of a locomotive and tender is recorded separately. British Railways Official Photograph.

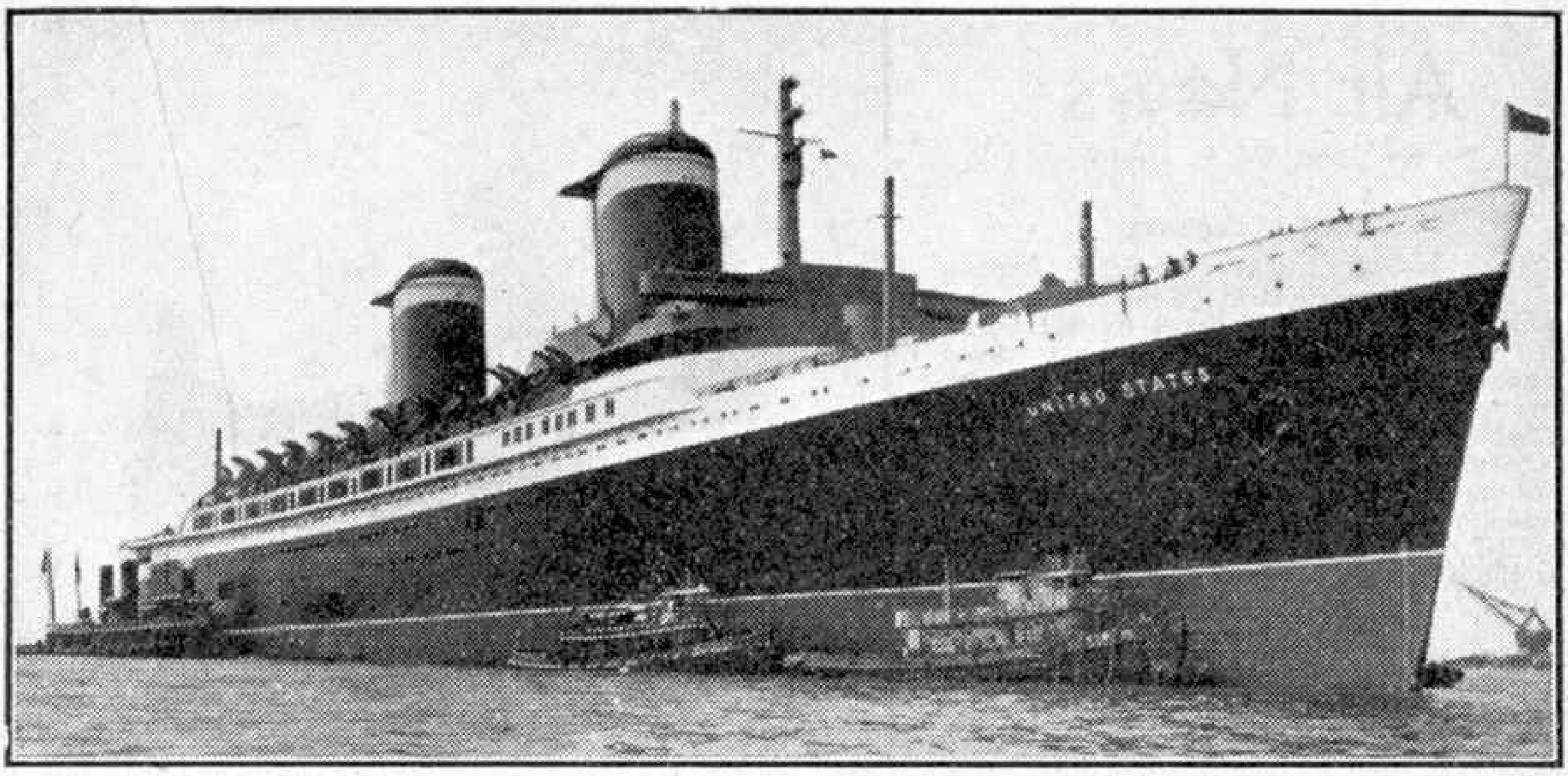
Inside examination showed that the joint of the supplementary steam pipe over the left driving wheel was blowing. This steam is led to the exhaust steam injector, on *"Lemberg"* under the left-hand side of the cab. The middle big end was just warm and I topped up the oil box. Nothing could be done with the piston gland; that was a task for the shops.

On looking into the matter of the groaning piston, it was discovered that no oil was passing through the corresponding oil pipe. Oil is pumped from the mechanical lubricator to the anti-carboniser, where it is thoroughly mixed with a jet of steam. This mixture then passes on into the steam chests and cylinders to do the work of lubrication. Oil in this form has less tendency to deposit carbon on the steam passages. However, the anti-carboniser joint was disconnected and oil was pumped through by rotating the lubricator hand wheel. Eventually things were to our liking and all joints were again connected.

In the cab an indicating plate was required for the cylinder cock gear lever. Another point that would require attention, once back in the Works, was a very slight leak on the train pipe side of the vacuum brake apparatus. The only acceptable efficiency of a locomotive brake is one hundred per cent.

We now sat on the bank and enjoyed our lunch and this gave a chance for the right driving box to cool off. At about 4.0 p.m. we "whistled up" and slowly moved up to Barkston North where the signalman told us that an express had left Grantham five minutes earlier and therefore we had to get a move on. Our reply was typical and we carried on at our usual pace but our peaceful progress was interrupted at Hougham when we were unceremoniously switched into the slow line. Driver Tacey jumped down, went to the doubtful driving box, and came back on to the footplate just as the 1.20 p.m. from King's Cross thundered by. His face was all smiles. *"She's ours"* he said, *"She's cooling off champion."*

From then on we had quite a good run. A fast sprint was required to see what was going to happen to that box so, to the usual unmistakable *"clank-clonk"* of such engines as ours, we galloped through Newark. Roaring hollowly over the Trent bridge, we took (*Continued on page 526*)



The Largest United States Liner

IN June last the largest passenger vessel ever built in the United States was christened. This was the 51,500 ton *"United States,"* seen in the illustration at the head of the page, which is now being fitted out in the yard of the Newport News Shipbuilding and Dry Dock Company. She will become the flagship of the United States Lines when she is ready for service, and completion is expected next year.

The *"United States"* has an overall length of 990 ft. Her beam is 101 ft. 6 in., and she will be able to pass through the Panama Canal, in spite of her immense size, with a clearance of 9 ft. on each side. From her keel to the top of the superstructure measures 122 ft., and the top of the forward funnel is 55 ft. above the deck. There are two funnels, the largest yet constructed. These are streamlined in shape in order to reduce wind resistance, and capped to prevent fumes from drifting down to the decks of the vessel.

The new vessel will be propelled by four screws driven by steam turbines, which will give her a speed of 30 knots. She will have a crew of 1,000 when in service, and accommodation of the highest standard will be provided for 2,000 passengers.

The liner has many remarkable features. To begin with, she was built in a dry dock, which was filled with water to float her when she was ready. This plan allowed the vessel to be brought nearer to completion when first floated than has been the case with any American vessel previously constructed. All her machinery, including her engines and boilers, and even the swimming pool provided for the recreation of passengers, was in place.

Immense quantities of timber were used in the construction of the vessel, but none of this will remain when she enters service, so that she will consist almost entirely of steel and aluminium, 193,000 pieces altogether. Special precautions have been taken to avoid the risk of fire. Even the special paint used on the ship was tested for its fire retarding qualities. Thin metal strips covered by it were heated electrically to a temperature of about 2,300 deg. F. but even at this temperature, at which ordinary paint bursts into flame, it did not burn or start a fire. In service therefore, practically the only danger of fire will come from the cargo or from passengers' luggage.

More than a million aluminium rivets were used in building the *"United States,"* in addition to 250,000 steel rivets. The steel rivets of course were made red hot and driven home while sizzling and smoking. Aluminium rivets require more complex treatment. They are first heated to a temperature of 1,040 deg. F. for half an hour and then frozen at a temperature of 40 deg. F. below zero. The frozen rivets are delivered to the workmen in insulated boxes, and when they thaw out after being driven they are far stronger than they were before this treatment was applied.

Air News

By John W. R. Taylor

U.S.A.F. "Canberra"

The B–57A night intruder version of the English Electric "Canberra," being built for the U.S. Air Force by the Glenn L. Martin Company, will have fixed forward-firing guns, a tail parachute brake and provision for carrying a considerable number of smaller bombs than those normally carried by the R.A.F. "Canberra." It will probably be powered by Armstrong Siddeley "Sapphires," built under licence by the American Curtiss-Wright Corporation as the J–65.

Rejuvenated "Dak"

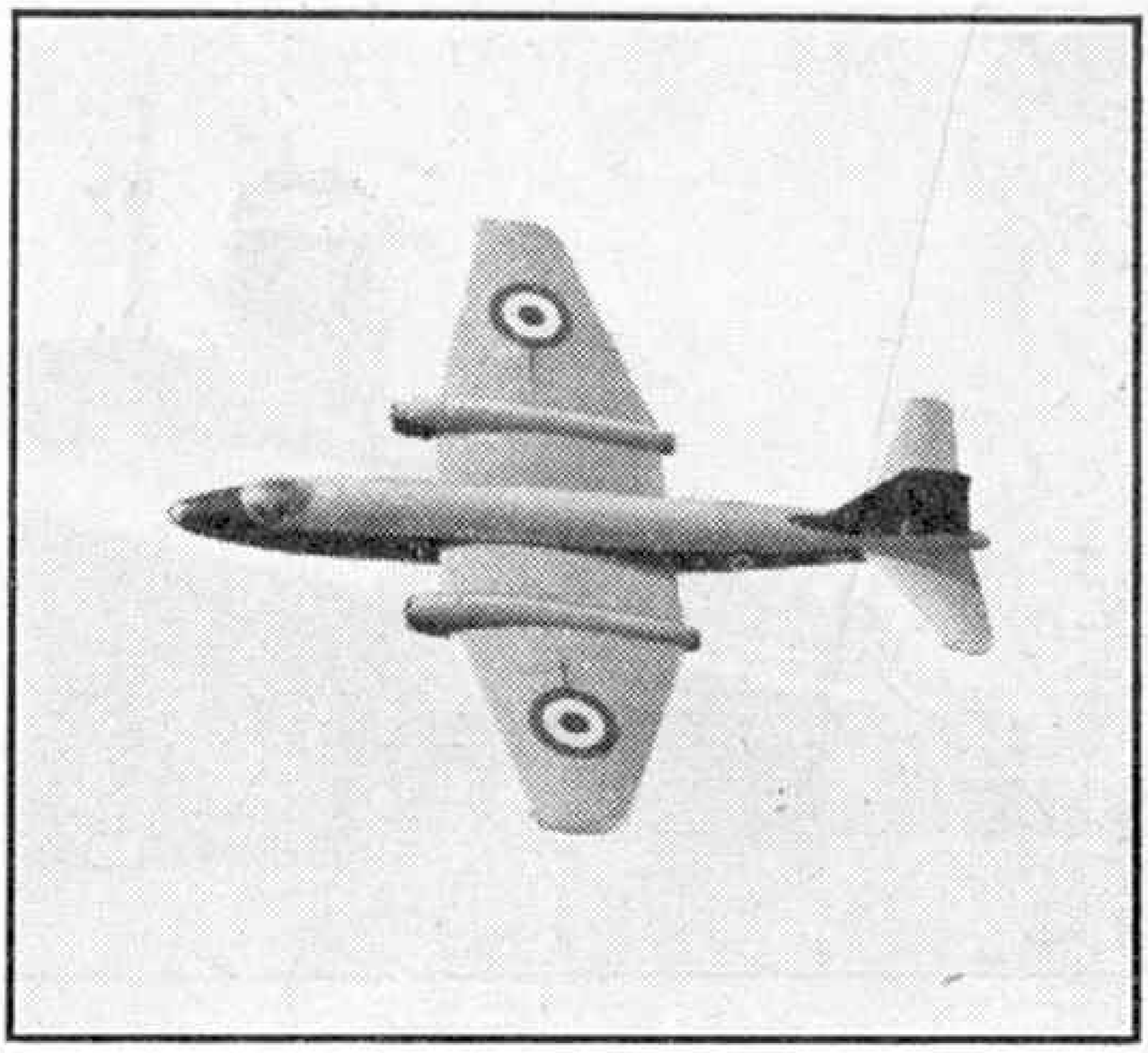
After 15 years' service on world air routes, the fine old Douglas DC.3 "Dakota" air liner has been redesigned by its makers, with such success that the resulting "Super DC.3" can hold its own in competition with most new machines of the same class.

Biggest attraction to the airline operator is that he is not expected to spend millions of pounds on new aeroplanes. All he has to do is return his old "Dakotas" to Douglas, who take them to pieces and rebuild them as "Super DC.3s" at much lower cost than supplying completely new machines. Improvements include the fitting of new outer wings and tail surfaces, a completely retractable undercarriage, modernised heating and safety equipment, more comfortable accommodation for up to 28 passengers, a new cargo compartment accessible from the ground, and more powerful engines. With two 1,475 h.p. Wright "Cyclones" the "Super DC.3" will cruise at 251 m.p.h. at 15,400 ft. and land in only 2,490 ft.

Following the lead of several airlines, the U.S. Navy have returned 100 of their "Daks" for modernisation.

Refuelling in Triplicate

Secret tests are being carried out over Southern England to increase the range of standard R.A.F. jet fighters by refuelling three or more of them at once in the air from a single tanker aircraft. The new experiments are a development of Sir Alan Cobham's flight refuelling technique, which was described in the January 1950 "*M.M.*," and involve the refuelling of specially-equipped "Vampires" and "Meteors" by means of hoses trailed from the fuselage and wing-tips of a "Lincoln" tanker.



English Electric "Canberra" jet bomber on a demonstration flight at Baltimore, U.S.A. A night intruder version is being built there for the U.S. Air Force by The Glenn L. Martin Co., to whom we are indebted for this photograph.

Irish "Millionaire"

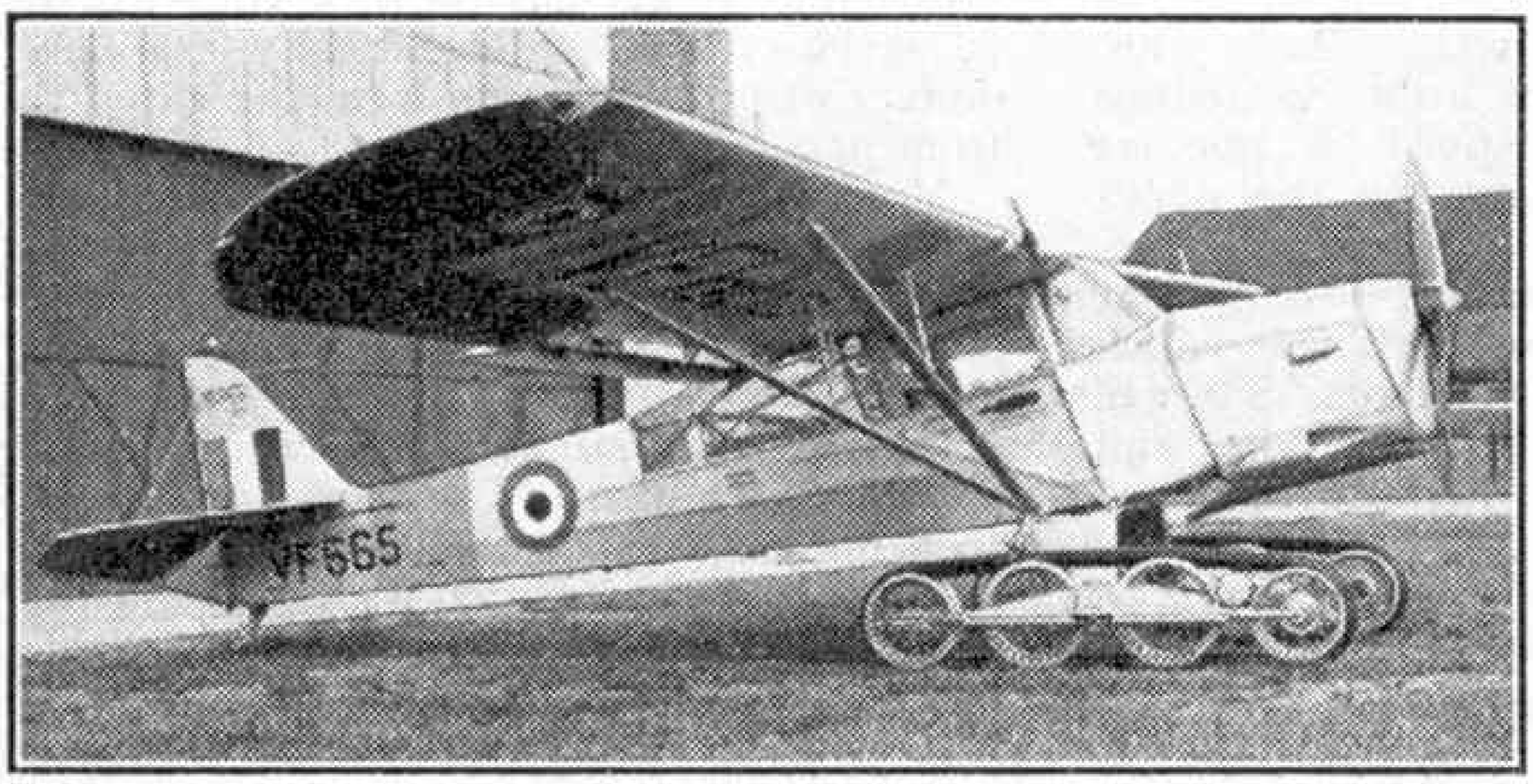
When Miss Joan Griffen, 27-yr. old typist, left Dublin recently on the 3.45 p.m. Aer Lingus flight to London, she was surprised to receive a large box of chocolates and a solid silver medallion recording the fact that she was the airline's millionth passenger.

Although Aer Lingus have been operating since May 1936, 900,000 of the million passengers have travelled in the last four years. Only 773 passengers were carried in the first year of operation, compared with 10,000 in one week in August this year.

Caterpillar "Auster"

A caterpillar undercarriage, like a small version of the wheels on an army tank, is being tested on a British Auster Mk. 7 light 'plane. It was designed by an Italian, Count Giovanni Bonmartini, to enable light aircraft to take off and land on small, rough airfields, and consists of two sets of four lightweight wheels, each set connected by an endless rubber belt.

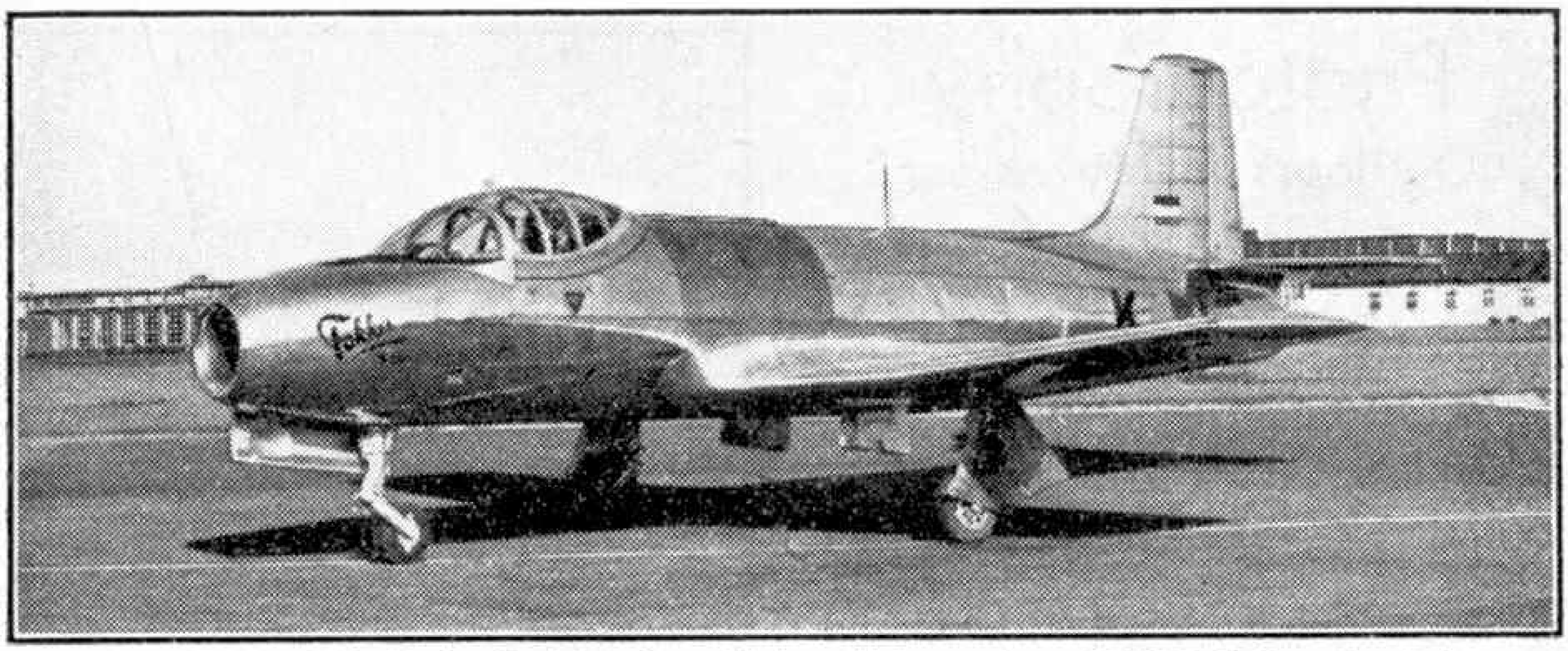
Each wheel has independent suspension, so that when the aircraft taxies over rough surfaces, the caterpillar track bends itself to the shape of the ground. It absorbs shock much easier than a normal undercarriage and enables the aircraft to land in about three-fifths of the normal distance. It also makes possible firmer, safer cross-wind landings on small fields.



The Auster Mk.7 with caterpillar undercarriage of Italian design referred to on this page. Photograph by courtesy of Auster Aircraft Company.

World Speed Record

During the American National Air Races at Detroit on 19th August last, Col. F. Ascani of the U.S. Air Force, flying a North American "Sabre" jet fighter, set up a new world speed record of 628.698 m.p.h. over a 100 km. closed circuit. The previous record of 605 m.p.h. was established



The new Fokker S.14 side-by-side jet trainer. Photograph by courtesy of K.N.V. Fokker, Amsterdam.

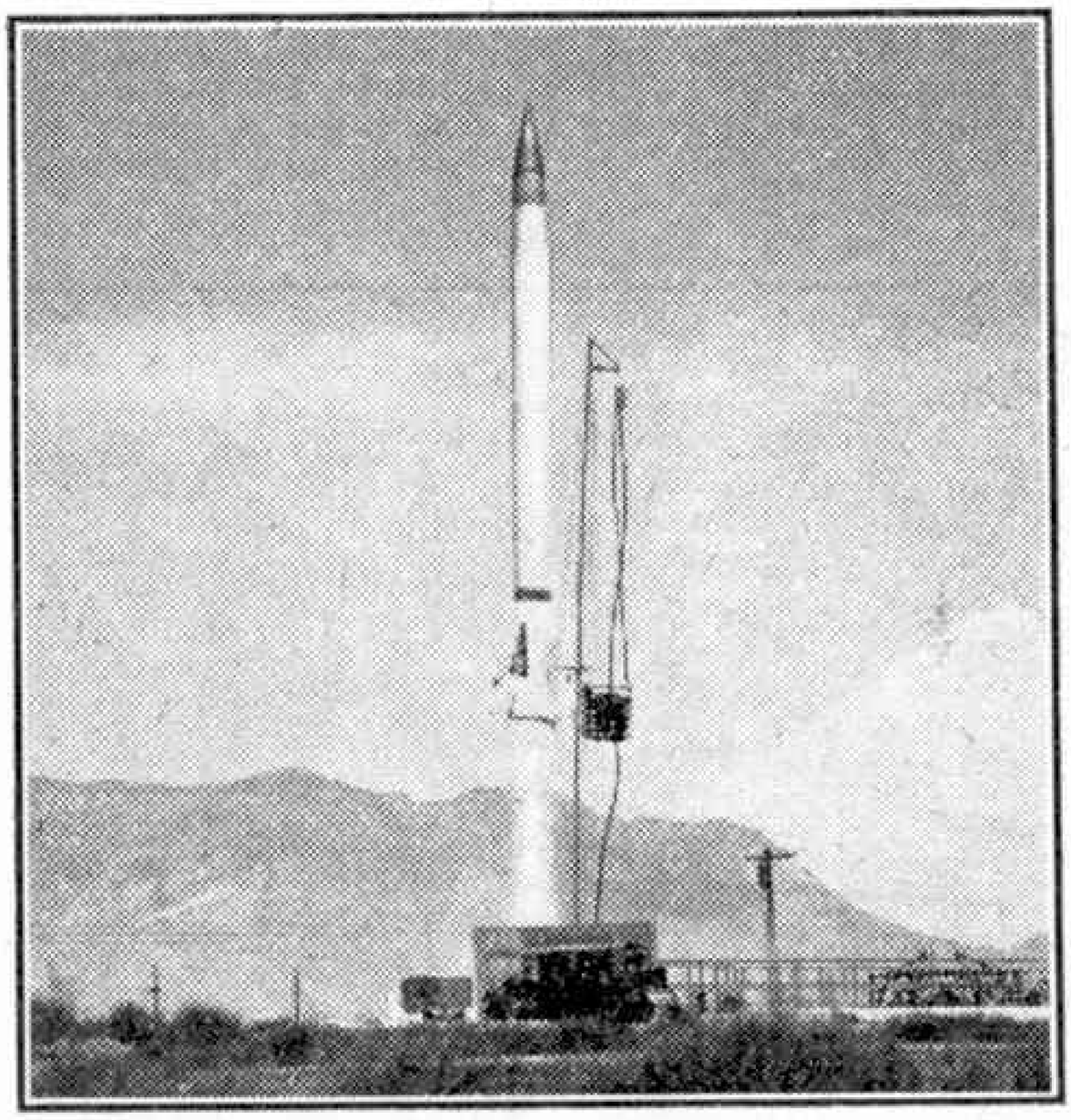
in 1948 by John Derry in a de Havilland 108.

A "Sabre" also holds the world's absolute speed record of 670.981 m.p.h. over a 3 km. straight course.

Dutch Jet Trainer

Experience has shown that crews of fast two-seat night fighters and light bombers work better if seated side-by-side. Pupil pilots also find it easier to learn if seated by the side of their instructor. The new Fokker S.14 side-by-side jet trainer, shown above, thus promises to be a most useful addition to Western Union air strength.

Unlike earlier jet trainers, which have been converted fighters, it was designed from the start as an operational trainer, and is fully equipped for all forms of flying and tactical training. It is fast enough to give pupils the "feel" of a jet, without cramping them into the small cockpit inevitable in a fighter, and without being as sensitive or difficult to fly as a highly-loaded warplane. Powered by a Rolls-Royce "Derwent" turbojet, it has a wing span of 39 ft. 5 in. and can cruise for nearly 3 hrs. at up to 400 m.p.h.



U.S. Navy's Martin "Viking" high-altitude research rocket roars upward to reach a record height of 135 miles. Photograph by courtesy of The Glenn L. Martin Co., U.S.A.

More "Viscount" Orders

Air France have increased their order for Vickers "Viscount" propjet air liners to a total of 12 aircraft. The first six will be delivered in 1953; the others in 1954.

The state-controlled Trans-Australia Airlines have also asked Government approval to buy six "Viscounts" for use on their internal routes. Their cost has been put at about £1½ million, and it was stipulated that they would be bought only if the Australian Government let T.A.A. have supplies of paraffin fuel free of Customs duty.

Rocket Progress

The U.S. Navy have announced that one of their Martin "Viking" rockets rose to a height of 135 miles during a test at White Sands Proving Ground in New Mexico. This beats by 21 miles the previous record for a single-stage rocket set up when German V–2s were fired from the same range in 1946. The "Viking" stayed in the air for 10 min., reached a maximum speed of 4,100 m.p.h. and landed about 41 miles from its launching site.

Flying Menagerie

There seems to be no limit to the variety of goods carried aboard Bristol "Freighters," but Silver City Airways must have set up something of a record recently by packing aboard one of their "Freighters" homeward-bound from Nairobi, a saloon car, a spare engine for a B.O.A.C. "Dakota," two large hams and enough animals to stock a menagerie. The animals were carried in crates lined up along the 30 ft.-long hold of the "Freighter," and included a young lynx, two cervals, four Cape hunting dogs, a Marabou stork, secretary birds, turacs, a silver-cheeked hornbill, and containers of lizards and snakes.

Fastest, Up and Over

The excellence of British military aircraft was demonstrated anew on 31st August last, when a Gloster "Meteor" fighter and an English Electric "Canberra" jet bomber set up a series of fine new records. The "Meteor," fitted experimentally with two "Sapphire" engines, established four World Class Rate of Climb Speed Records. It was flown by Flt. Lt. R. B. Prickett, and from a standing start reached 3,000 m. in 76 secs., 6,000 m. in 110 secs., 9,000 m. in 145 secs. and 12,000 m. (39,400 ft.) in 187 secs. Standard foreign jet fighters take about 10 mins. to reach 40,000 ft.

The "Canberra," piloted by Wing Cdr. R. P. Beamont, set up a new record for the East to West Atlantic crossing, by flying from Aldergrove, N. Ireland, to Gander Lake, Newfoundland, in 4 hr. 18½ mins., at an average speed of 480 m.p.h.

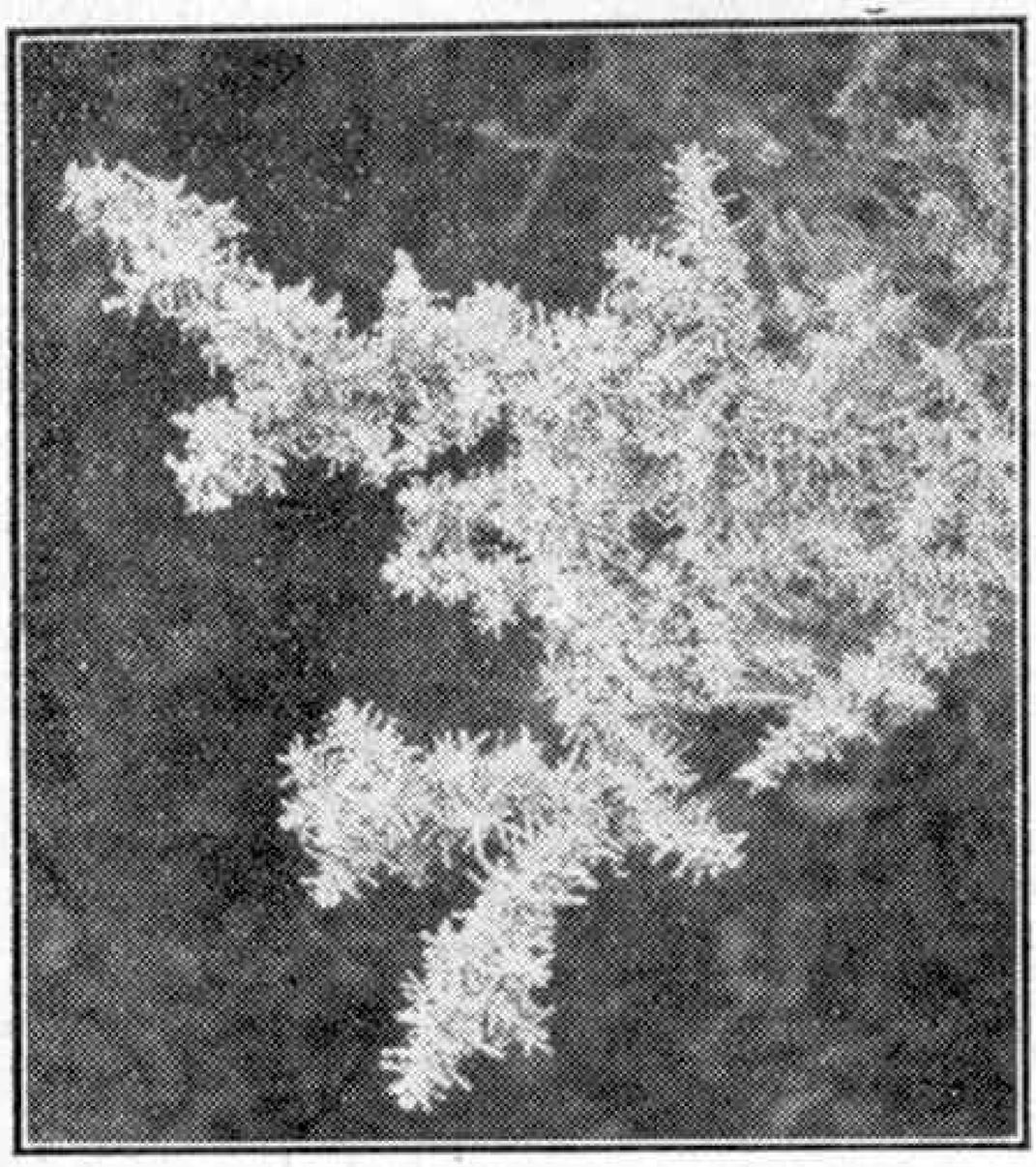
Photography

Outdoors in November

By E. E. Steele

ALTHOUGH November has a bad reputation as a month of dull, cold foggy days, it can produce also some brilliant sparkling days, with white hoar frost giving place to warm sunshine, which makes the trees and hedgerows glow all the more with golden leaves yet unfallen.

On such a day the huntsmen and the hounds provide a colourful scene as they spread through



Hoar frost on gorse.

meadow and thicket in search of the wily old fox. The local newspapers usually give the dates and places for these meetings some time before the event. As the assembly point is frequently on some village green a number of pictures can be taken there with little difficulty. If one knows which way the hunt will move off, it is possible to get in to a favourable position and photograph the passing parade. If one actually follows the hounds there may be a lucky chance to picture "Old Reynard" breaking cover, with the hounds in full cry, although this is the thing photographers dream about, but seldom realise.

When the weather develops into cold, freezing fog, as often happens in late November, many interesting photographs may be taken of frost-crystals on fence and foliage, and frequently on the window-panes of out-houses, where patterns can be induced by wetting the panes of glass at night.

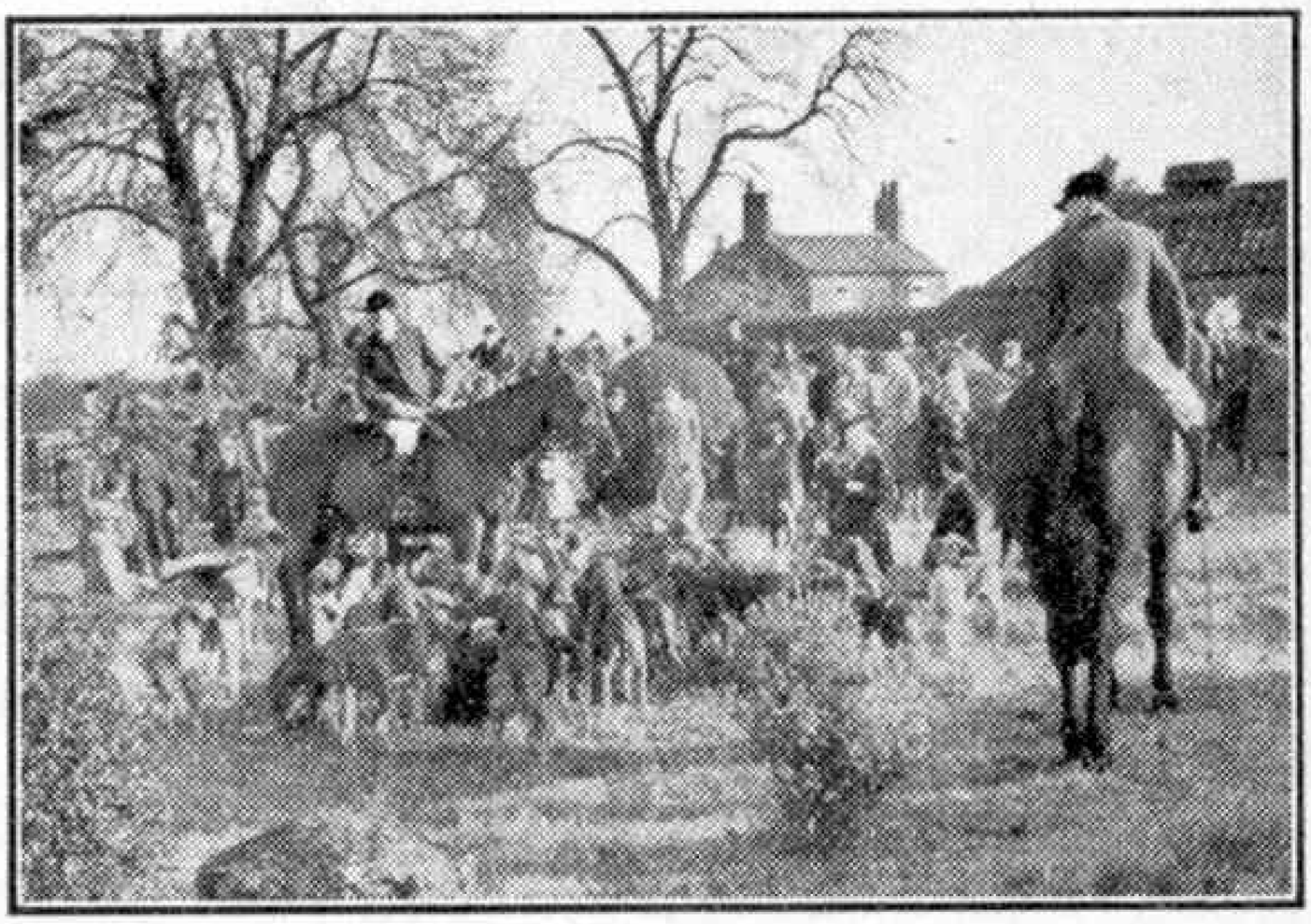
The softening mist tones down harsh outlines and makes ordinary landscapes attractive. The introduction of a few figures, such as farm workers, or a rabbit shoot,

Rabbit shooting. The illustrations to this article are by the author.

which often takes place at this slack time, will provide many good opportunities for pictures.

When bringing the camera out of a warm room into such weather conditions, condensation will almost surely form on the lens and should be carefully wiped off with a clean handkerchief. This should be done also when the camera is again brought into a warm room.

Foggy conditions, by subduing and softening the contrasts which sunlight gives, may cause flatter negatives than one desires. Developing the film for some 50 per cent. longer than normal will give brighter results, as will a harder grade of printing paper. However, delicate misty tones have a charm of their own which can be spoilt by exaggerating contrast.



November hunt.

Prizes for Meccano Models

Still Time to Send in Your Entry

We wish to remind model-builders that there is always at least one model-building competition open for entries and we invite every reader to take part in these contests. At present the "October" Competition is open, and in this Contest fine cash prizes are offered for the best Meccano models of any kind sent in by "*M.M*" readers, no matter where they live.

All a competitor has to do is to think of a new model, and then to set to work to construct it as neatly and realistically as possible from standard Meccano parts.

When the model is completed it is only necessary to obtain either a photograph or a good sketch of it and send this to us. *The actual model must not be sent.* The photograph or drawing need not be the competitor's own work, but it is absolutely essential that the model itself should be the result of his or her own unaided efforts. The competition is open to readers of all ages living in any part of the world.

The judges will award the prizes for those models that are the most original in subject and are neatly designed and proportioned, and which are built on correct mechanical principles.

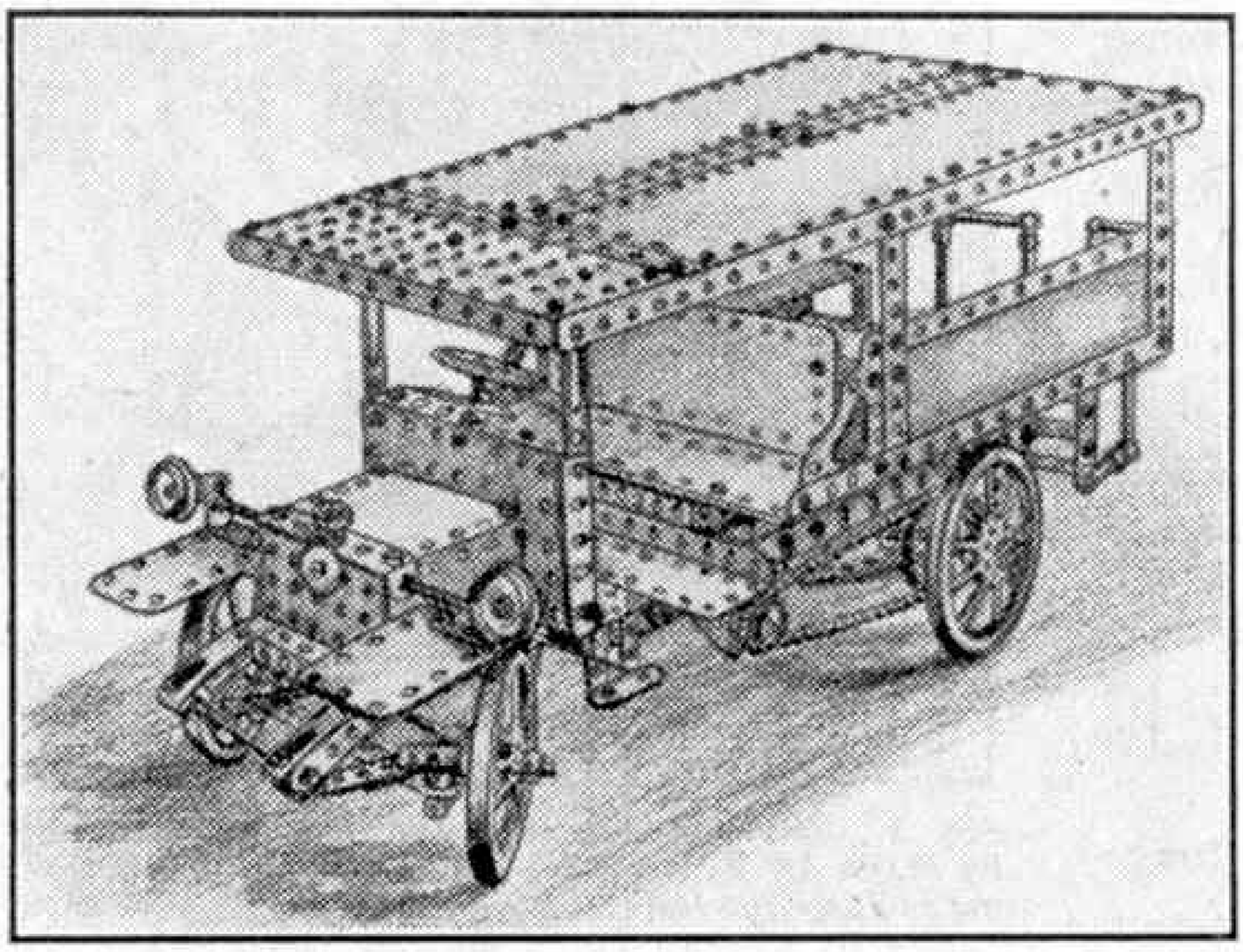
The Contest will be divided into the following two Sections: A, for competitors of all ages living in the British Isles, B, for competitors of all ages living Overseas.

The following prizes will be awarded in each of the Sections A and B: First, Cheque for £4/4/–; Second, Cheque for £2/2/–; Third, Cheque for £1/1/–. Ten Prizes each of 10/6, and Ten Prizes each of 5/–. Certificates of Merit also will be awarded.

Models of any kind whatever may be submitted, and any number of parts may be used in building models, but good solid construction will count more than mere size alone.

Before posting their entries competitors must take care to write their age, name and address clearly on the back of each photograph or drawing submitted.

Closing dates: Home Section, 30th November, 1951; Overseas, 29th February, 1952. Envelopes should be addressed *"October Model-Building Competition, Meccano Ltd., Binns Road, Liverpool 13."*



Not many "M.M." readers will have seen the original of this fine model of an Albion 2-cylinder Shooting Brake, which was in use in 1911. The model was built by George S. Henderson, Edinburgh, and was awarded First Prize in the "Transport Past and Present" Competition.

MECCANO COMPETITIONS RESULTS

By "Spanner"

"Transport Past and Present" Competition (Home Section)

First Prize: Cheque for £3/3/–; G. S. Henderson, Edinburgh 7. Second Prize: Cheque for £2/2/–; S. Reid, Aberdeen. Third Prize: Cheque for £1/1/–; J. Thorpe, Sidcup, Kent.

Five Prizes each of 10/–: S. Edmonds, Shorne, Kent; M. Bunten, Newport, Essex; C. Webb, Garstang, Nr. Preston; T. B. Bindoff, New Malden; A. W. Miller, Ruthergien, Glasgow.

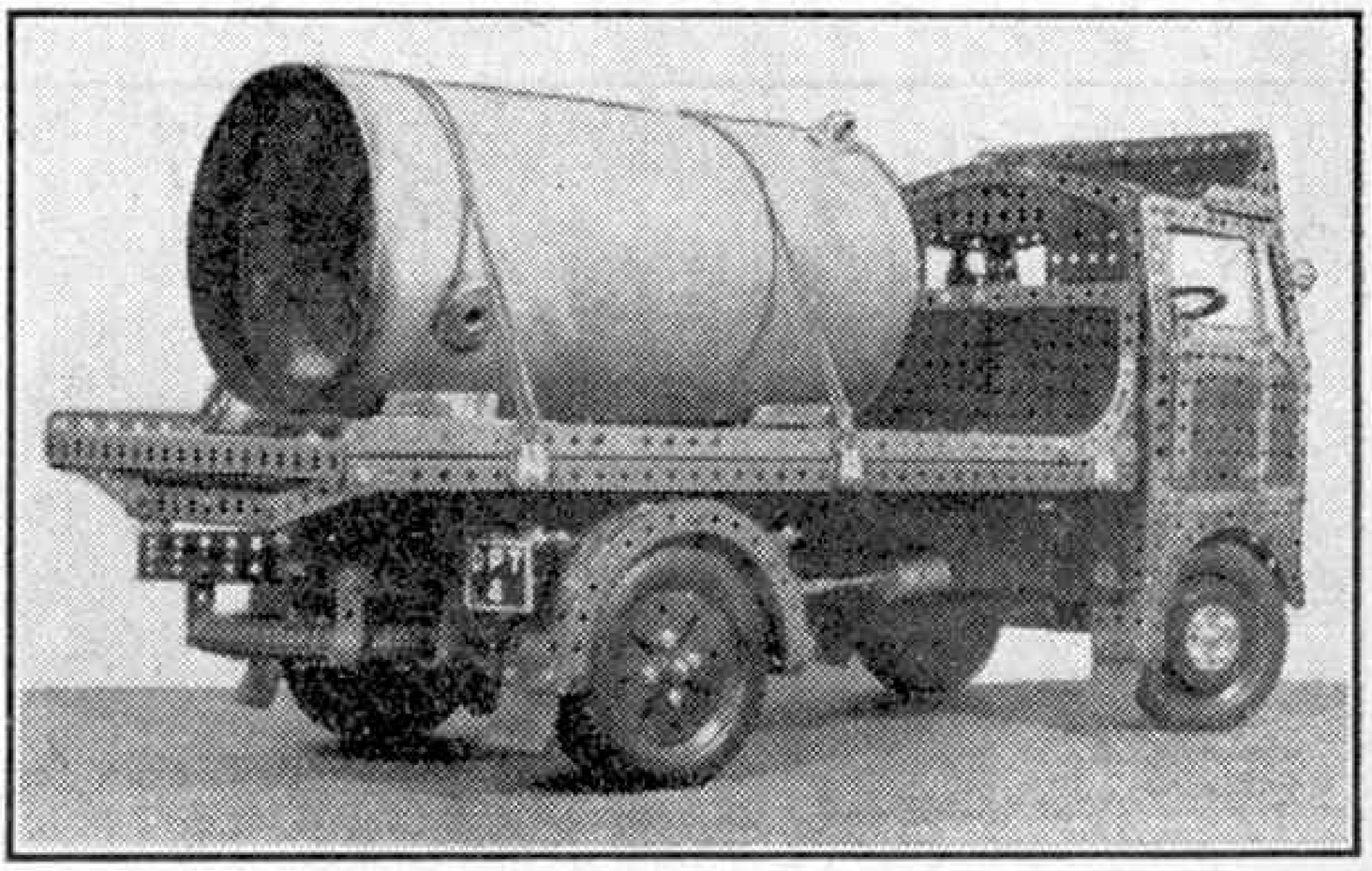
Five Prizes each of 5/–: K. Nash, Norwich; W. R. Tandy, Coleford, Glos.; D. Armitage, Doncaster; F. G. Glass, Warlingham, Surrey; B. R. Harris, London S.E.18.

"Meccano Mechanisms" (Home Section)

First Prize: Cheque for £3/3/–; C. F. Price, Epsom, Surrey. Second Prize: Cheque for £2/2/–; A. J. Doggett, Iver, Bucks. Third Prize: Cheque for £1/1/–; D. Irving, Hutton, Essex.

Five Prizes each of 10/–: R. Waterlow, North Wembley; J. Winney, Hatch End, Middx.; M. C. Murphy, Sheffield; P. Ross, Ilford, Essex; B. Brasier, Ruislip, Middx.

The *"Transport Past and Present"* Competition produced some very fine and interesting entries and the subjects ranged from early mail coaches to a pair of roller skates!



A heavy motor lorry in which much interesting detail work can be seen. It was built by J. Thorpe, Sidcup.

Among the Model-Builders

By "Spanner"

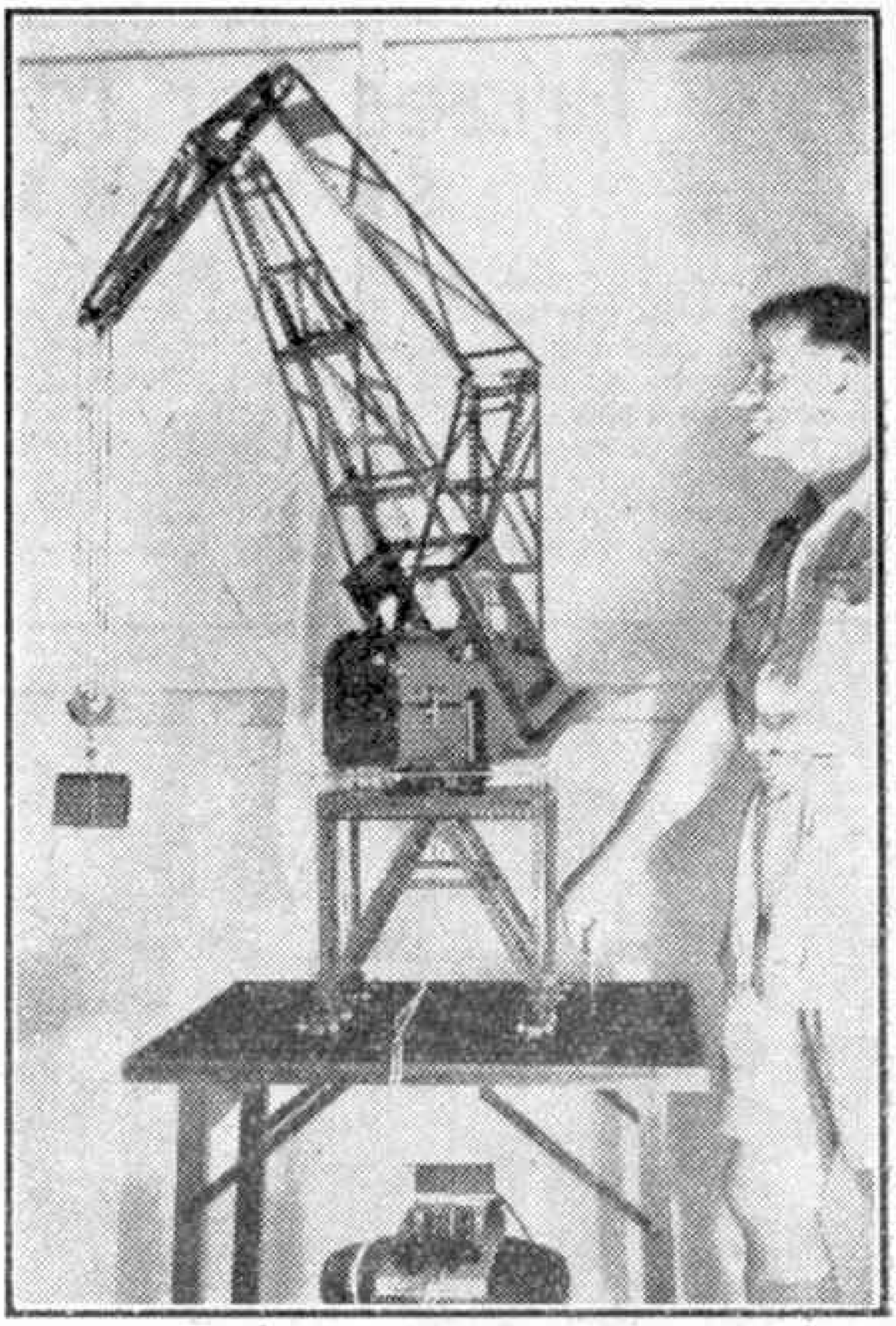


Fig. 1. This imposing level-luffing crane was built by Major D. F. Densham-Booth, R.E. The model is particularly interesting in view of the fact that each of its motions has a separate power drive.

Interesting Power Driven Crane

A model of a level-luffing crane, in which the mechanical arrangements are of particular interest, came to my notice recently. The model is the work of Major D. F. Densham-Booth, R.E., Surbiton, who is seen with it in the upper picture on this page. It is based on an illustration in a manufacturers' catalogue, and its various motions are actuated by two 6-volt Motors and a Clockwork Motor.

All the operations are controlled from a central position in the engine housing, the mechanism of each motion being equipped with band brakes and sliding driving shafts, to facilitate individual control. Although the model is approximately 5 ft. in height, it is very stable, due to the care taken in the proportions of the structure and in the design of the superstructure bearing.

A Four-Speed and Reverse Gear-Box

Roland Brown, Oakham, sent details of a four-speed and reverse gear-box he has designed. It is illustrated on this page and is intended primarily for use in model tractors, although it can of course be used in other ways.

This gear-box is 4" long. The input shaft 15 carries a 1" Gear 1 and a $\frac{3}{4}$" × $\frac{1}{2}$" Pinion 2. The shaft is journalled in the centre hole of a $1\frac{1}{2}$" Strip at the front of the $2\frac{1}{2}$" × $1\frac{1}{2}$" Flanged Plates, which form the main part of the sides of the gear-box, and in the Flat Trunnion bolted at the front of the gear-box between two $1\frac{1}{2}$" Angle Girders 14. These Angle Girders are joined to the Flanged Plates by two $3\frac{1}{2}$" Strips, which overlap the Flanged Plates four holes, and the end of the shaft protrudes into the boss of the 57-tooth Gear 4. This Gear 4 has a Wheel Disc bolted to it so as to form a better socket for the Rod 15 and reduce end play.

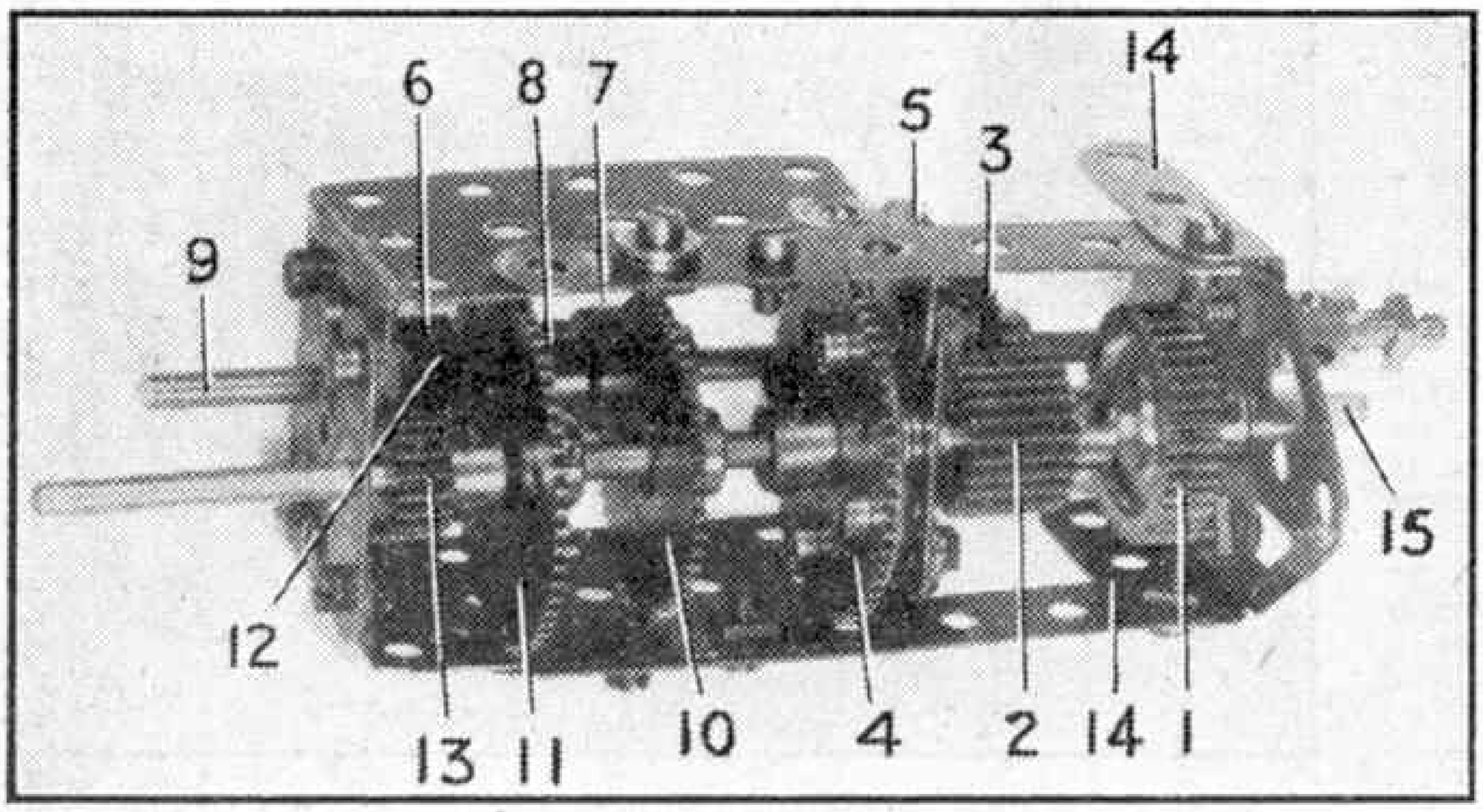


Fig. 2. A four-speed and reverse gear-box built by Roland Brown, Oakham.

The layshaft 9 carries a 1" Gear 3 and a 50-tooth Gear 5, which mesh with Gears 1 and 2 on the Rod 15. It also carries two $\frac{1}{2}$" × $\frac{1}{4}$" Pinions 6 and 7 in the positions shown, and a $\frac{3}{4}$" × $\frac{1}{4}$" Pinion 8. These Pinions mesh with the 57-tooth Gear 4, the 50-tooth Gear 10

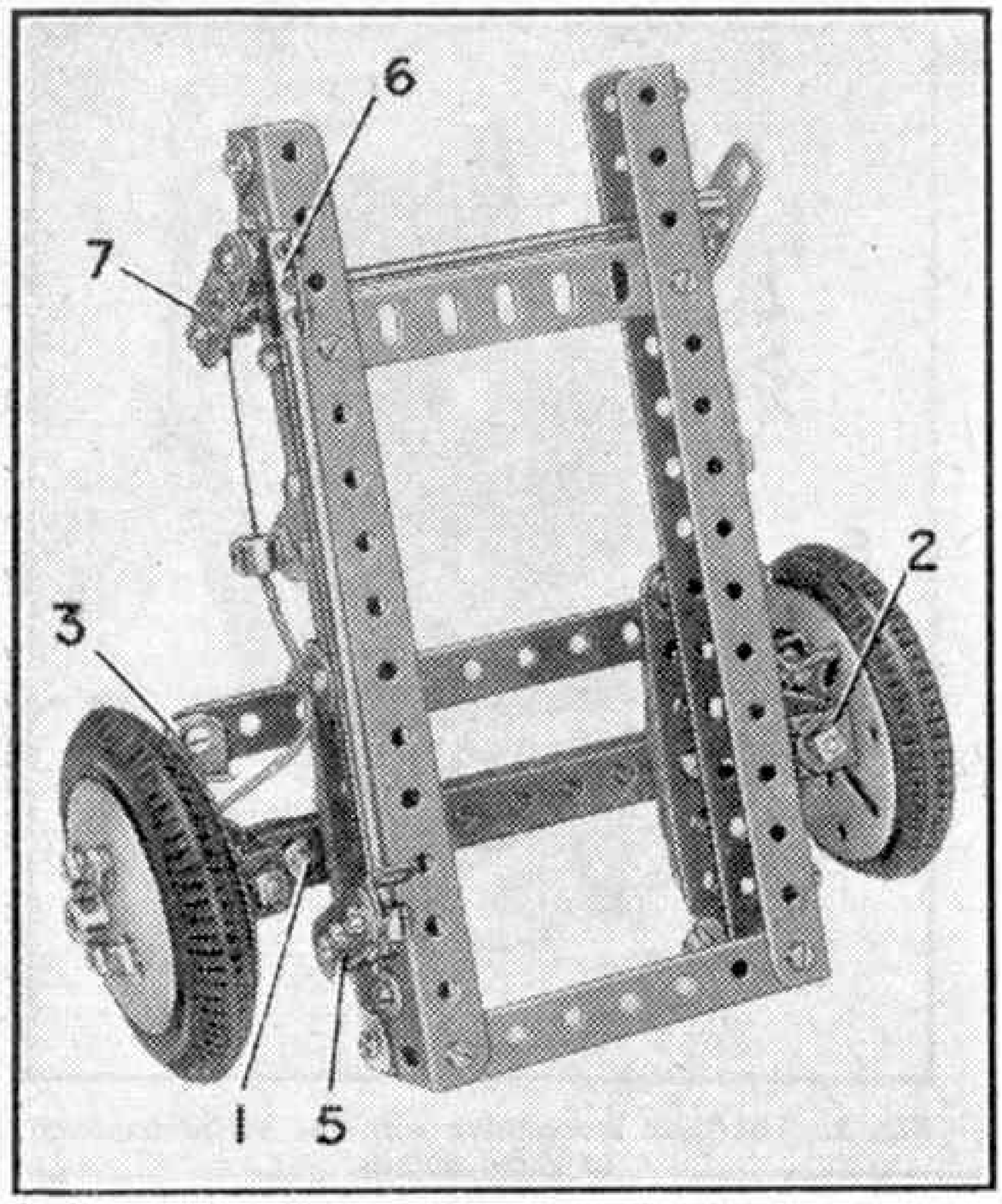


Fig. 3. A front axle unit incorporating internal expanding brakes, designed for use in model motor lorries.

and a 57-tooth Gear 11, while for reverse, the ½″ Pinion 6 meshes with the second ½″ Pinion 12 loose on a Bolt fixed to a 1½″ Strip at the rear of the gear-box. Pinion 12 meshes also with another ½″ Pinion 13 on the output shaft, which is journalled in a 1½″ Strip at the top of the rear of the gear-box.

Top gear is obtained by meshing Gears 1 and 3 and 8 and 10. Second gear is obtained by meshing Gears 2 and 5 and 8 and 10. Third gear is obtained by sliding the layshaft to the extreme right so that Gears 1 and 3 mesh and the Pinion 7 meshes with the Gear 4. Bottom gear is obtained by meshing Gears 2 and 5 and 6 and 11.

Reverse is obtained by sliding the layshaft to the extreme left so that Gears 2 and 5 and 6, 12 and 13 engage.

The ratios of the gears are, top 2:1, third, 3:1, second 4:1, bottom 6:1 reverse, 2:1.

Front Axle Unit for Lorries

Figs. 3 and 4 show a complete front axle unit specially designed for model lorries. The road wheels are fitted with simple internal expanding brakes operated from a foot pedal through flexible cables. The main feature of the unit is that the 2″ Pulleys normally used with the Motor Tyres are replaced by Boiler Ends, which serve also as the brake drums. This arrangement greatly reduces the distance between the point of contact of the tyre with the ground and the axis of the stub axle, and so provides much more accurate steering.

The axle beam is made from three or four 4½″ Strips clamped together, and it is attached to leaf springs each built up from two 3½″, two 2½″ and two 1½″ Strips. The springs are pivotally attached to the chassis by Double Brackets at the front and by Angle Brackets and Fishplates at the rear.

Two ½″ Reversed Angle Brackets 1 are bolted at each end of the axle beam, and these are connected by lock-nutted bolts to 1½″ × ½″ Double Angle Strips 2. The Double Angle Strips are fixed to Face Plates used as the back-plates of the brakes. A Corner Angle Bracket 3 is bolted to each Face Plate, and these are linked by a 5½″ Strip held by lock-nutted bolts.

The brake shoes are 4½″ Strips curved to a slightly smaller radius than that of the Boiler Ends. An (*Continued on page 526*)

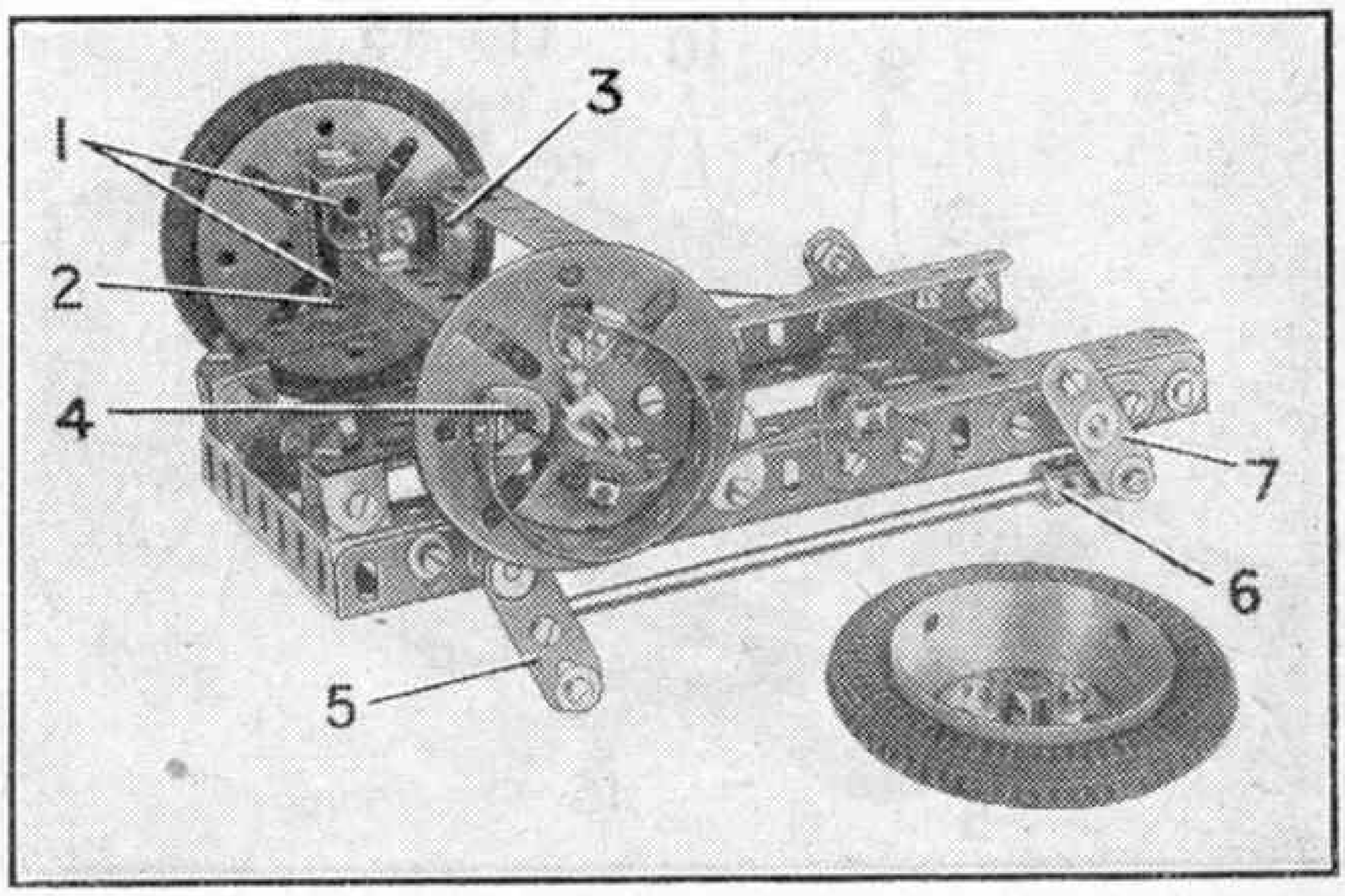


Fig. 4. The front axle unit with one of the wheels removed to reveal the details of the brake mechanism.

New Meccano Models

Good Subjects for Outfits No. 1 and No. 5

CONSTRUCTION of the model tank locomotive shown in Fig. 1 is begun by bolting a 12½″ Angle Girder 1 to each of the longer flanges of a 5½″ × 2½″ Flanged Plate 2. A 3½″ Strip 3 is bolted across the Flanged Plate, and a similar Strip is used to connect the Angle Girders 1 at their forward ends.

The main frames are 12½″ Angle Girders 4, and they are attached to the 3½″ Strips by Angle Brackets. The buffer beam is made from two 2½″ Strips overlapped, and is fixed by Angle Brackets to the Curved Strips 5. The Curved Strips support also a 1½″ Strip on each side, and a 2½″ × 1½″ Flexible Plate, bent as shown in Fig. 2, is fixed to a Reversed Angle Bracket 6. Two 2½″ × 1½″ Flexible Plates are shaped to the same radius as the Curved Strips and are bolted to a Double Bracket attached to the buffer beam.

The water tanks are made from 5½″ × 2½″ Flexible Plates edged by 2½″ and 5½″ Strips, and they are fixed to the main frames. A 5½″ Strip is attached to the top of each tank by Angle Brackets,

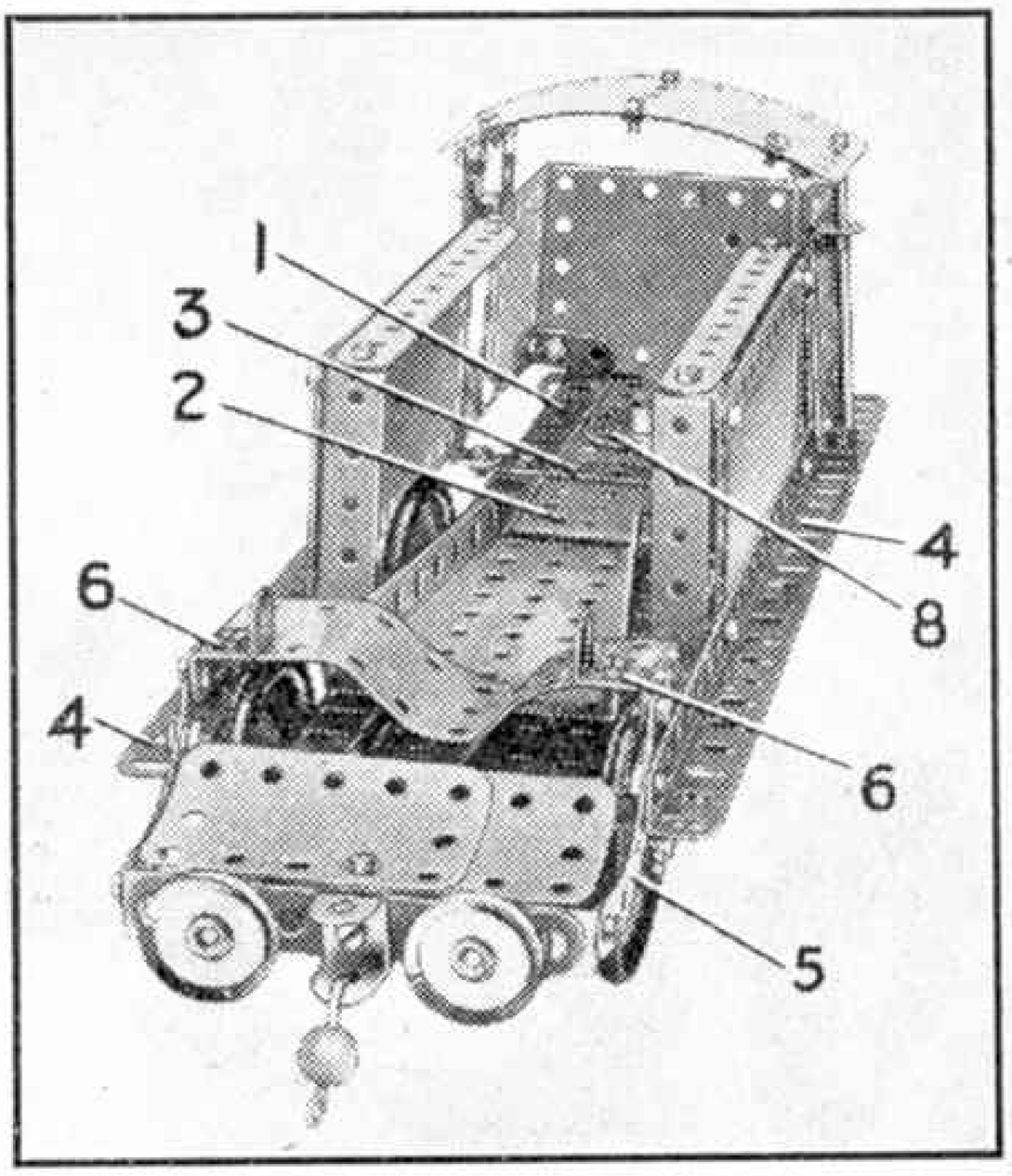


Fig. 2. The tank locomotive with the boiler removed to show details.

and the front is filled in by a 2½″ × ½″ Double Angle Strip.

The sides of the coal bunker are 2½″ × 2½″ Flexible Plates, braced by 2½″ × ½″ Double Angle Strips 7, which serve also as supports for the Rods representing the handrails. The rear of the bunker consists of two 2½″ × 2½″ Flexible Plates and it is fixed to Angle Brackets bolted to the sides.

The cab roof is made from two 1 11/16″ radius Curved Plates bolted together. It is supported by Obtuse Angle Brackets fixed to 2½″ Strips.

The driving wheels are Road Wheels fixed on 4″ Rods mounted in Trunnions and Flat Trunnions bolted to the Girders 1. The coupling rods are 5½″ Strips, lock-nutted at each end to an Angle Bracket that is fixed by a nut and bolt to the boss of one of the Road Wheels. Each bolt is fitted with a nut and then passed through the

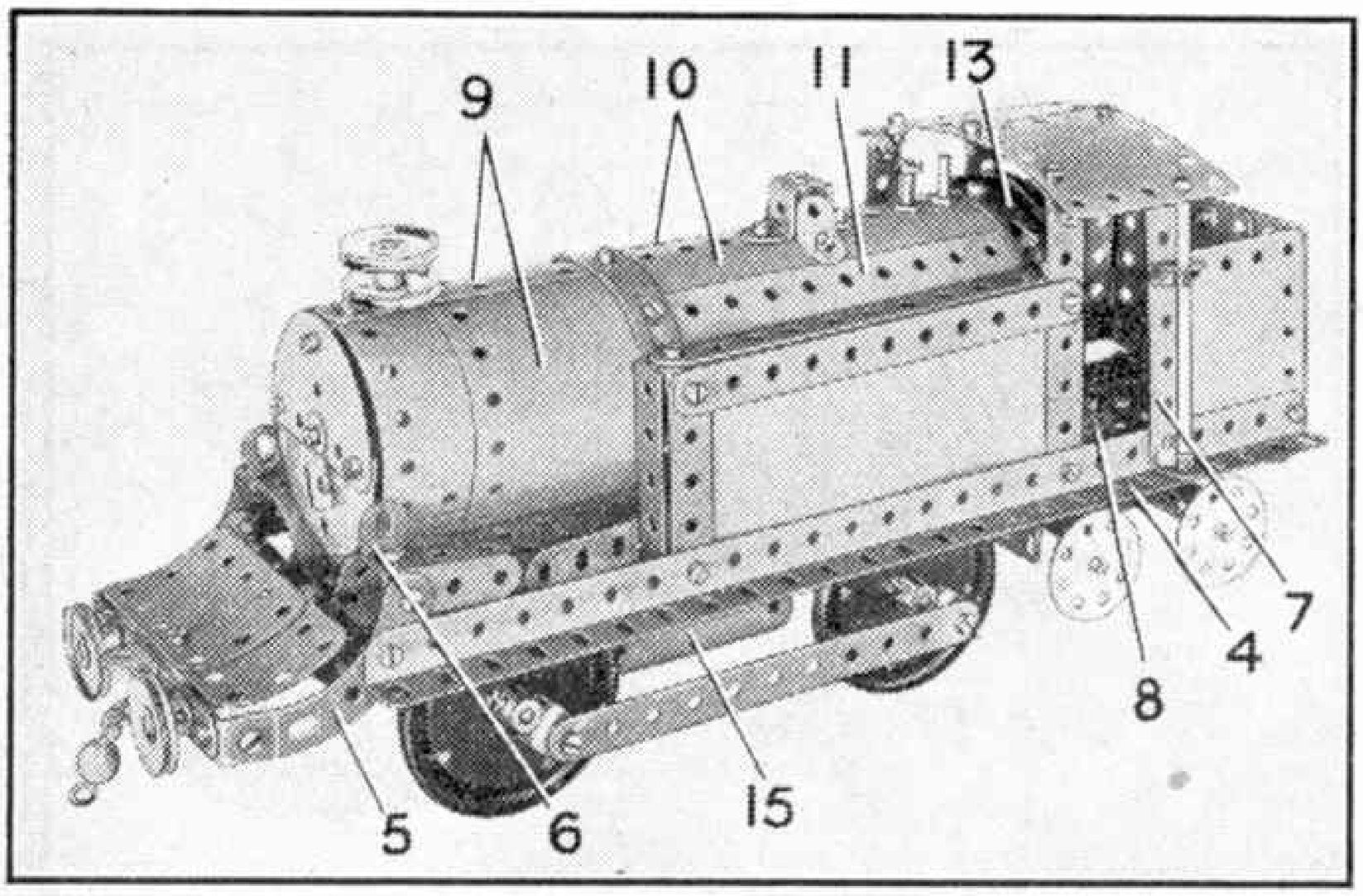


Fig. 1. Outfit No. 5 contains all the parts required to build this typical tank locomotive.

slotted hole of the Angle Bracket and screwed into the boss of the Road Wheel. The nut is then tightened against the boss to hold the Angle Bracket firmly in place.

The bogie unit is a $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Flanged Plate fitted at each end with a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. The bogie wheels are Wheel Discs, and each is free to turn on a $\frac{3}{8}''$ Bolt attached by two nuts to one of the lugs of the Double Angle Strips. The bogie unit pivots on a 2" Rod fixed in a Bush Wheel 8. The unit is held in place by a Spring Clip and a Cord Anchoring Spring.

The boiler is shown separately in Fig. 3. The smoke-box door is made from two Semi-Circular Plates, fitted with a $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip. Two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates are curved to the same diameter as the Semi-Circular Plates, and are fixed to the lugs of the Double Angle Strip. The $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates are extended by two $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates 9, bolted together to form a cylinder. The section of the boiler above the water tanks is made from two $5\frac{1}{2}'' \times 1\frac{1}{2}''$ Flexible Plates 10, and two $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plates 11. The lower edges of Plates 11 are braced by $5\frac{1}{2}''$ Strips, and they are connected across by two Formed Slotted Strips 12. A $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip is fixed between Plates 10 and Strips 12, and a 3" Pulley 13 is attached to it by a $\frac{1}{2}''$ Bolt.

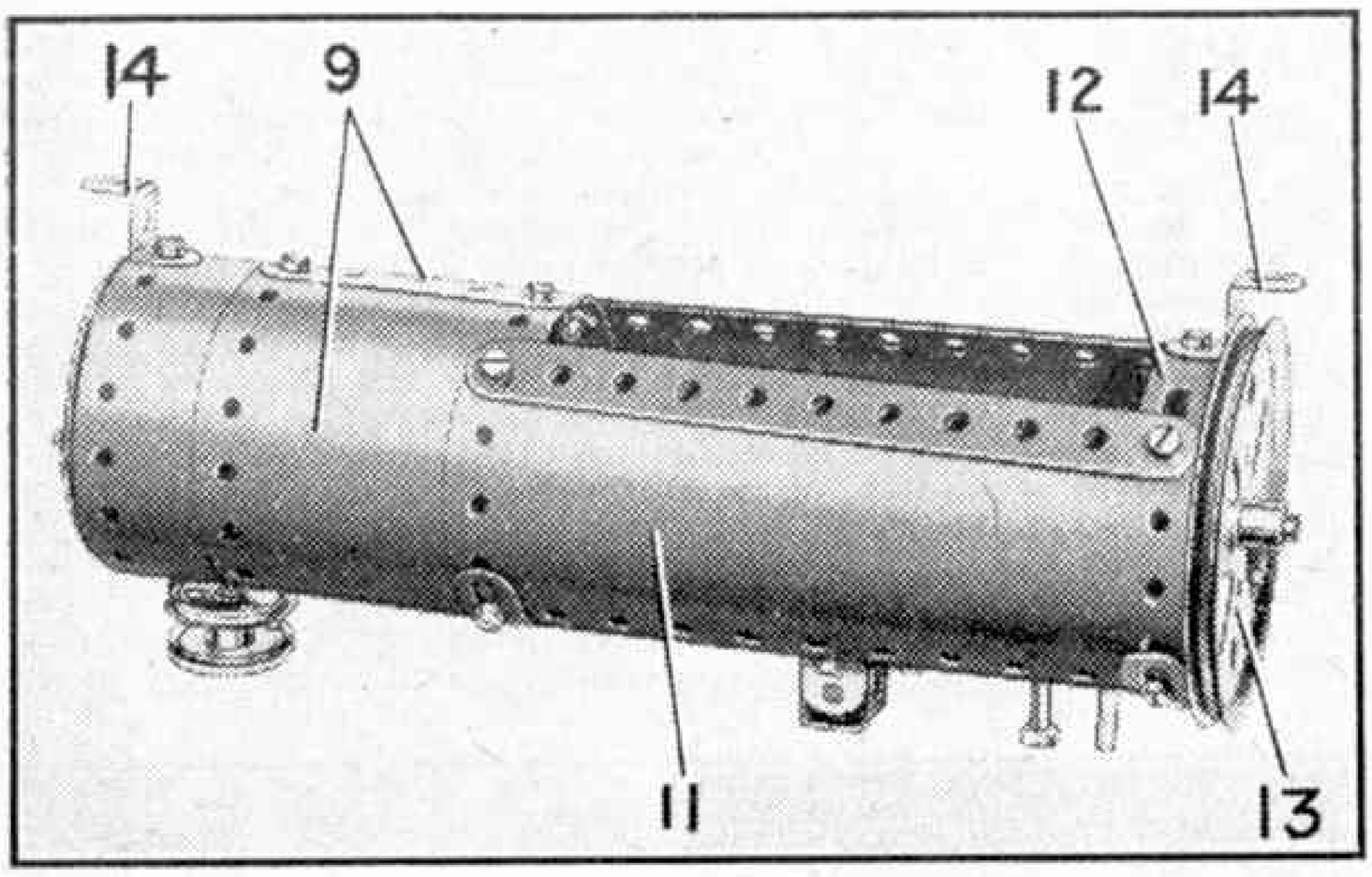


Fig. 3. The boiler of the locomotive photographed upside down to demonstrate its construction.

The boiler is completed by adding the chimney and dome made as shown in Figs. 1 and 3, and it is attached to the body of the model by Reversed Angle Brackets 14.

Two U-section Curved Plates 15 are opened out slightly and one is bolted to the Girder 1 on each side.

Parts required to build the model Tank Locomotive: 10 of No. 2; 2 of No. 3; 12 of No. 5; 2 of No. 6a; 4 of No. 8; 1 of No. 10; 4 of No. 11; 12 of No. 12; 2 of No. 12a; 4 of No. 12c; 2 of No. 15b; 2 of No. 16; 1 of No. 17; 1 of No. 18a; 1 of No. 19b; 5 of No. 22; 2 of No. 22a; 1 of No. 23; 1 of No. 24; 4 of No. 24a; 5 of No. 35; 98 of No. 37; 10 of No. 37a; 12 of No. 38; 1 of No. 44; 1 of No. 45; 8 of No. 48a; 1 of No. 51; 1 of No. 52; 1 of No. 54; 1 of No. 57c; 2 of No. 90a; 2 of No. 111a; 6 of No. 111c; 1 of No. 115; 4 of No. 125; 2 of No. 126; 2 of No. 126a; 1 of No. 147b; 1 of No. 176; 4 of No. 187; 4 of No. 188; 4 of No. 189; 6 of No. 190; 2 of No. 191; 4 of No. 192; 2 of No. 199; 1 of No. 212; 2 of No. 214; 3 of No. 215.

The simple mobile crane shown in Fig. 4 can be built from the parts in Outfit No. 1 and is fitted with mechanisms for luffing the jib and raising or lowering the load.

The base of the model is a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate, to which Flat Trunnions are bolted to carry a $3\frac{1}{2}''$ Rod on which the front wheels are mounted. The rear wheels are fixed on a 2" Rod mounted in a bogie unit formed (*Continued on page 526*)

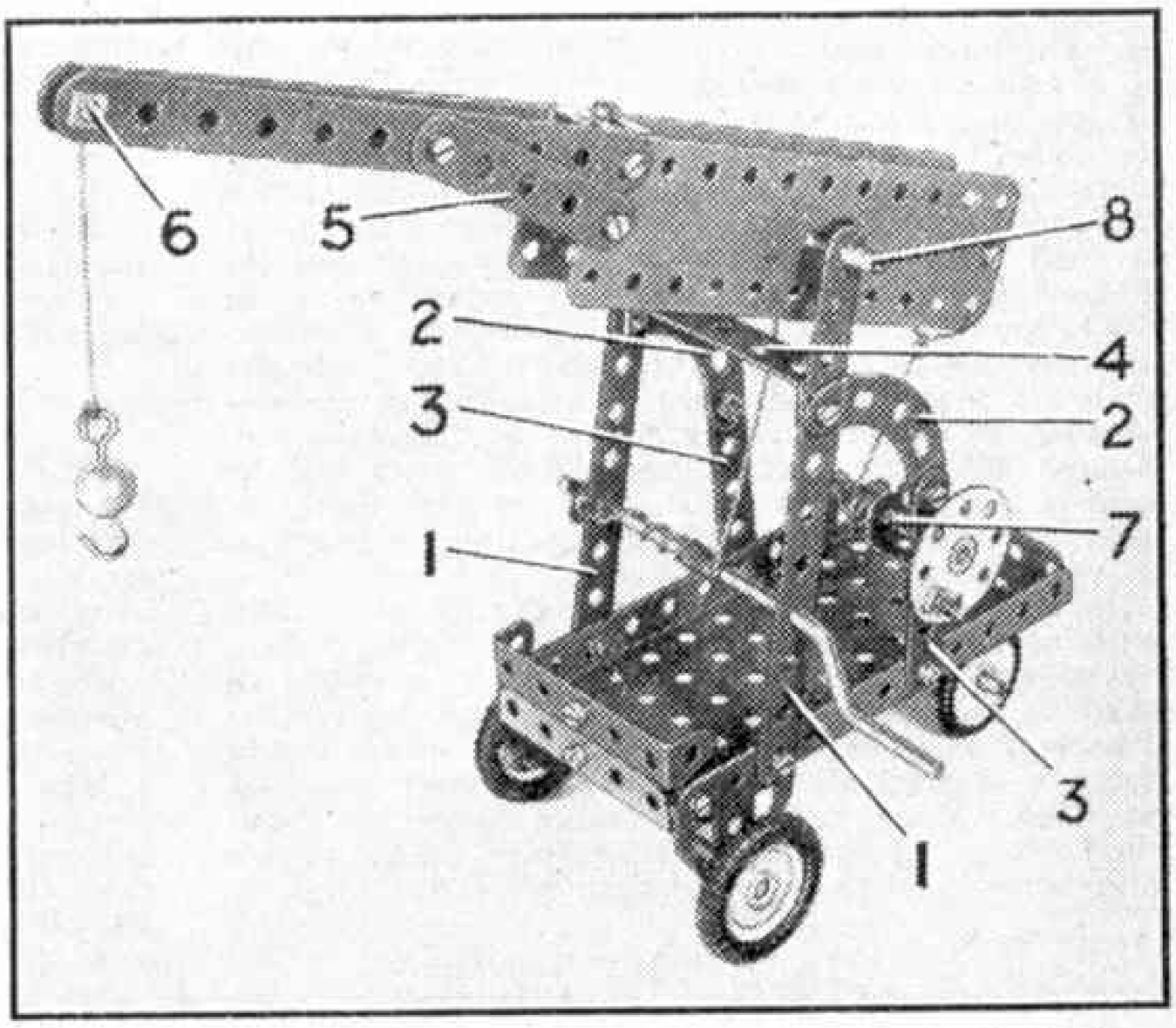


Fig. 4. A three-wheeled mobile crane that can be built from parts in a No. 1 Outfit.

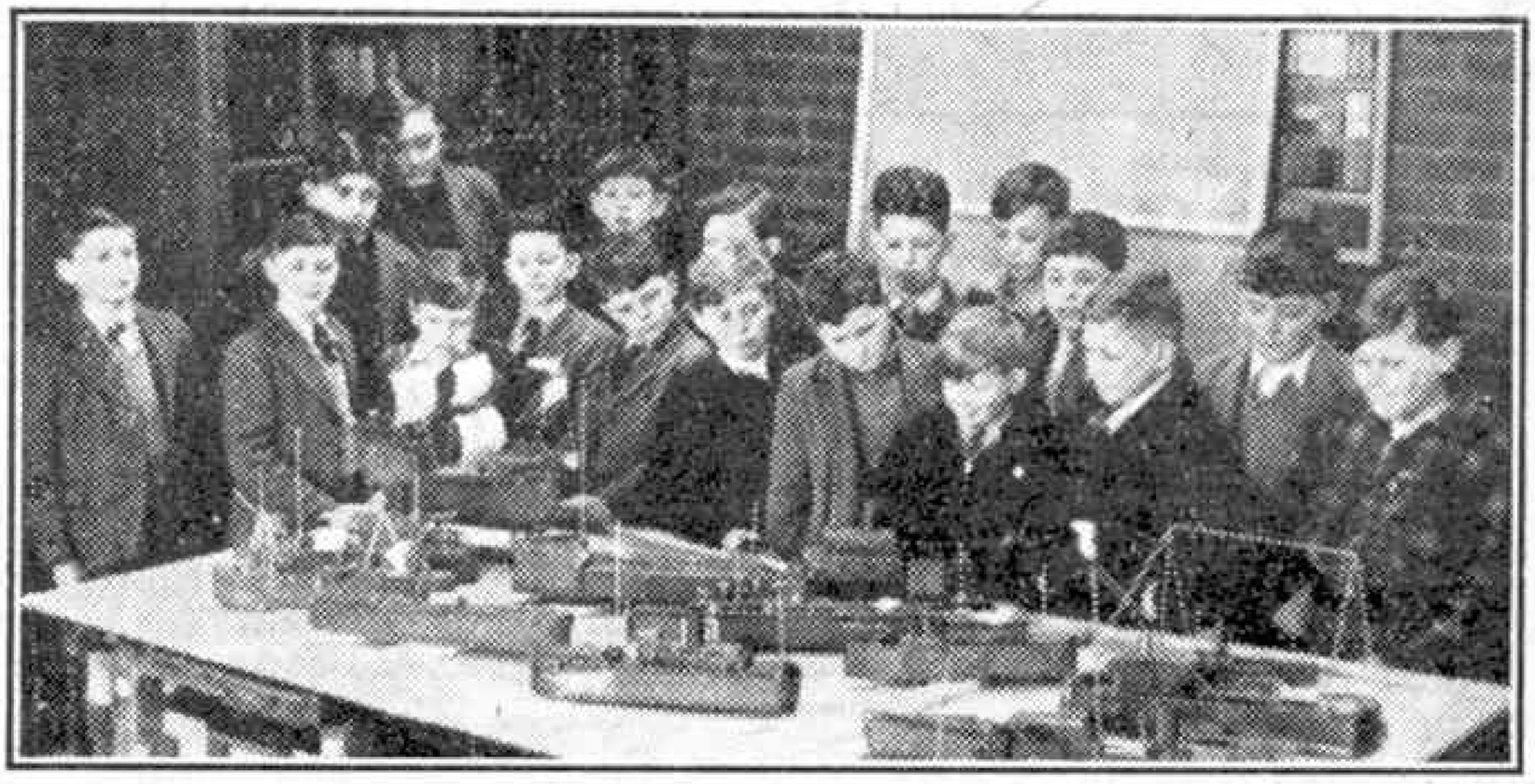
Club and Branch News

WITH THE SECRETARY

SURPRISES FOR MEMBERS

Clubs are now settling down for the first of the two Winter Sessions. Behind them is the start of the programme, agreed to with enthusiasm at the general meeting called to settle the nature of proceedings during the winter sessions; ahead are preparations for the Christmas season, which certainly should be thought of now, as to leave them until the last moment can only lead to disappointment. One Christmas essential is a Social Evening, an outward expression of the goodwill and friendliness that marks Club life. If at all possible an Exhibition of models also should be organised for December to provide parents and friends with an opportunity of seeing something of the Club's activities and of appreciating the spirit and enterprise of members.

All this is routine, and in every well conducted Club is enjoyable in the highest degree, as the continued enthusiasm of members clearly demonstrates. At the same time Leaders should always be on the lookout for something that will add to the excitement. This something should be unexpected, and if possible have an air of mystery about it. If announced beforehand it should just be described as a surprise event, leaving members to guess, as wildly as they please, about its nature.



Members of the Appleby (Eden Valley) M.C. inspecting some of the fine entries in a Ship Model-building Competition included in the Club's programme. Contests of this kind are the chief feature of the activities of this fine school Club, Leader, Mr. W. E. Ward, which was affiliated with the Meccano Guild in April last.

TRY MYSTERY MODELS

One form of an event of this kind might take is a visit to some Works of special interest. Others are a visit to a picture house when a film of outstanding merit and suitability is showing, or a special Model-building Contest of the short and sharp variety. It is good fun also to suspend ordinary activities for a time to exhibit a "mystery" model, with an invitation to members to think out how it works and perhaps to build for themselves a similar model to prove that they are right. The detective element of such a task invariably makes a strong appeal. Almost any model with simple movements can be used if the gearing is hidden, say by Flat Plates or even by sheets of card, leaving only the actual movements obvious to the eye.

Imagine the excitement if the Leader of a Club, without any warning, were to roll along a table a cylindrical model that immediately rolled back of itself to its starting point. There would be excited questions as to how it worked, and members would begin to hazard all kinds of explanations. This can be done. Many Leaders probably know all about the trick, and I should be glad to send details of this returning model to any who have not seen it.

CLUB NOTES

Belgrave Union M.C.—The summer programme included the Annual Sports Meeting, Cricket Matches and a Mock Trial. Table Tennis is played. The Car Section is very active in constructional work. When one outdoor games meeting was held up by a storm members returned to the Club Room for a "Twenty Questions" session. Club roll: 48. *Secretary:* E. J. Crossley, 22, Johnson Street, Leicester.

Stroud M.C.—The subject of an interesting Model-building Competition was agricultural machines, a straw baler winning the first prize. The annual Garden Party was successful. The display included a Hornby layout and many side shows in addition to excellent Meccano models. The models indeed were so good that the Club was invited to provide a display at a Horticultural Show. Club roll: 40. *Secretary:* W. Jackson, 234, Stroud Road, Gloucester.

HOLLAND

Memoka (Monnikendam) M.C.—Intense Model-building activity prevails at the meetings of this recent affiliated Club. A fine display, which attracted 1,200 visitors, included a splendid wood saw mill and other working models. Wood cases have been constructed for storing Club material. Club roll: 20. *Secretary:* J. P. v. Dieren, 12, Noordeinde, Monnikendam.

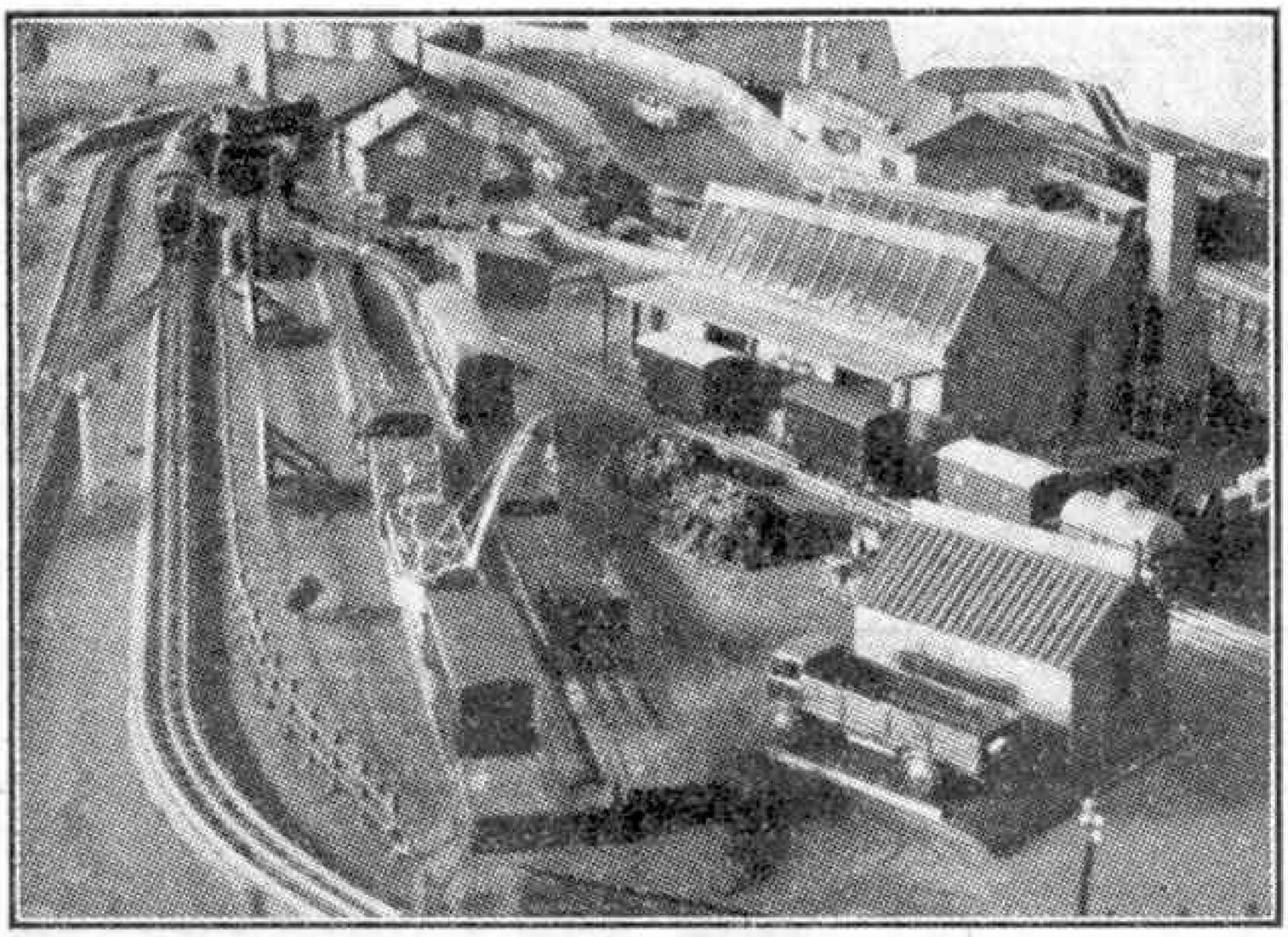
BRANCH NEWS

New College Railway Club (Harrogate)—Frequent meetings are held, members bringing their own locomotives to run on the Branch Hornby-Dublo track. This is sectional and a special switchboard has been constructed for control purposes. More than 60 members and friends visited the North Road Locomotive Works at Darlington, and the Faverdale Wagon Works also were inspected. *Secretary:* D. E. Broadbent, New College, Harrogate.

New Road (South Chingford)—The Branch display on the occasion of Chingford Day was very successful, the track being in operation continuously throughout the afternoon and evening. The Mayor and Mayoress of Chingford were among those who saw the exhibit, and it was estimated that about 9,000 people visited the display. Track Nights continue to provide valuable practice for members. *Secretary:* Mr. K. R. White, 136, Westward Road, South Chingford, London E.4.

An Extensive Hornby-Dublo Layout

WE illustrate on this page parts of the extensive Hornby-Dublo layout operated by Mr. S. H. Cooper, of Leicester, and his son. After a considerable period of development, these keen Hornby-Dublo owners have just been able to complete their original plans. Apart from the railway itself, careful attention has been paid to lineside detail and surroundings; and the results, as our pictures show, are very realistic.



A view across the goods yard of the Hornby-Dublo layout of Mr. S. H. Cooper, Leicester. The goods warehouse is prominent in the centre of this picture.

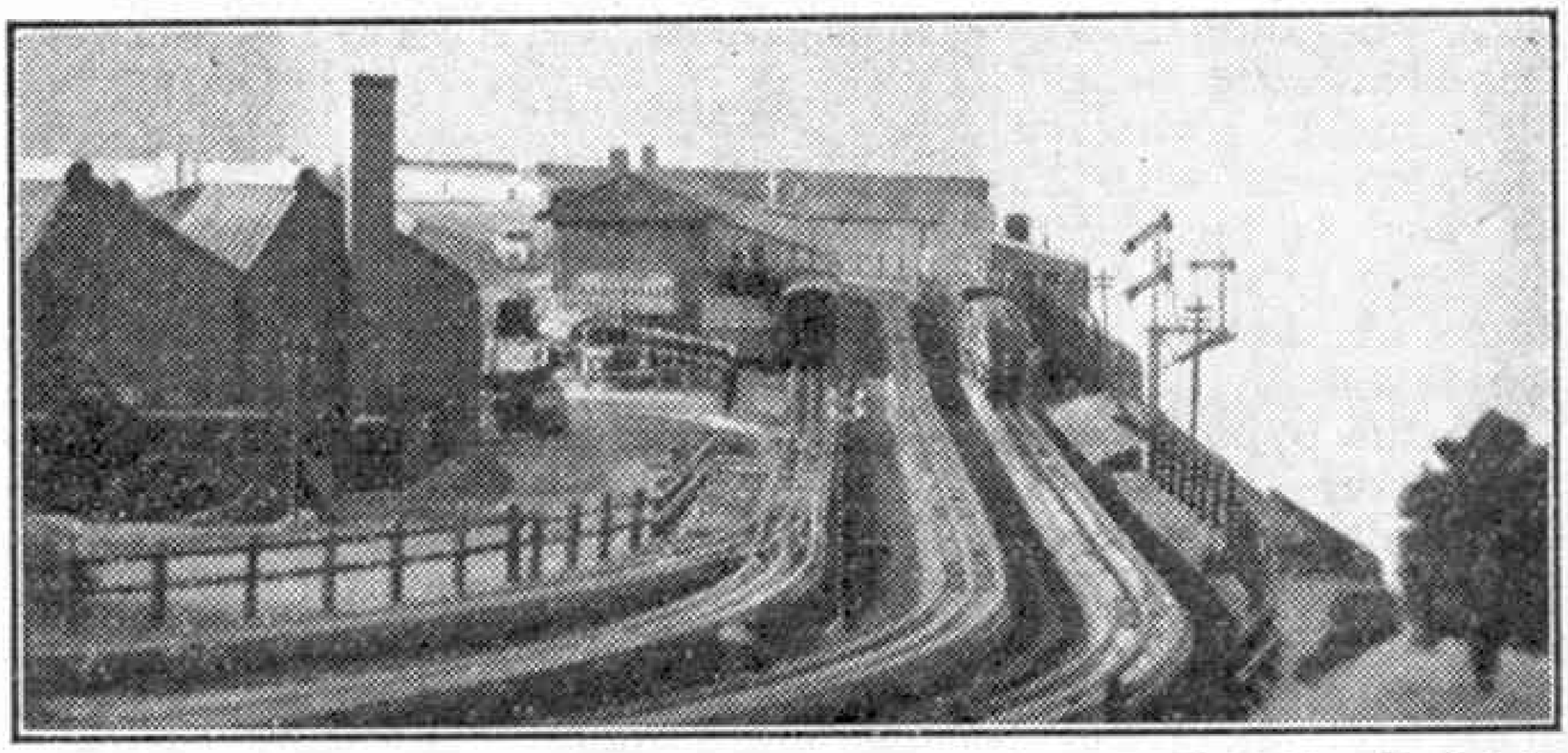
The system is now laid out on three tables. Two of these lie more or less at right angles to one another and are joined by a lifting section that enables the operators to move freely about the layout. The third forms a continuation of the second. The main line is double track throughout.

On the first table there is an inner continuous circuit, with empty carriage roads and sidings serving a goods warehouse and various industrial buildings. Points are arranged so that trains can readily reach this inner circuit from the main lines. A passenger station is arranged on this section, and part of the buildings and footbridge can be seen in the top right hand corner of the upper photograph.

On the second table, which carries the country section of the layout, the main lines pass through a tunnel and there is in addition a loop that allows traffic in one direction to avoid the tunnel. The third table has been added recently. It has on it the main station and a marshalling yard.

Each of the three types of Hornby-Dublo Locomotive is represented on the system, a "Duchess of Atholl" and a "Sir Nigel Gresley" being available for passenger traffic. There are two Tank locomotives which for the most part share the goods and shunting duties. Standard Hornby-Dublo passenger stock and the usual variety of goods vehicles are in use.

The buildings, which have been made to suit their particular situations, have been built in balsa wood and modelling papers have been used to cover them. Lineside banks have been made up by using a card or paper surface glued over wooden supports. Trees consist of wire wool mounted on privet twigs.



Looking down the main line towards one of the stations. Realistic lineside details are a feature of this layout.

Varied Schemes for Hornby Railways

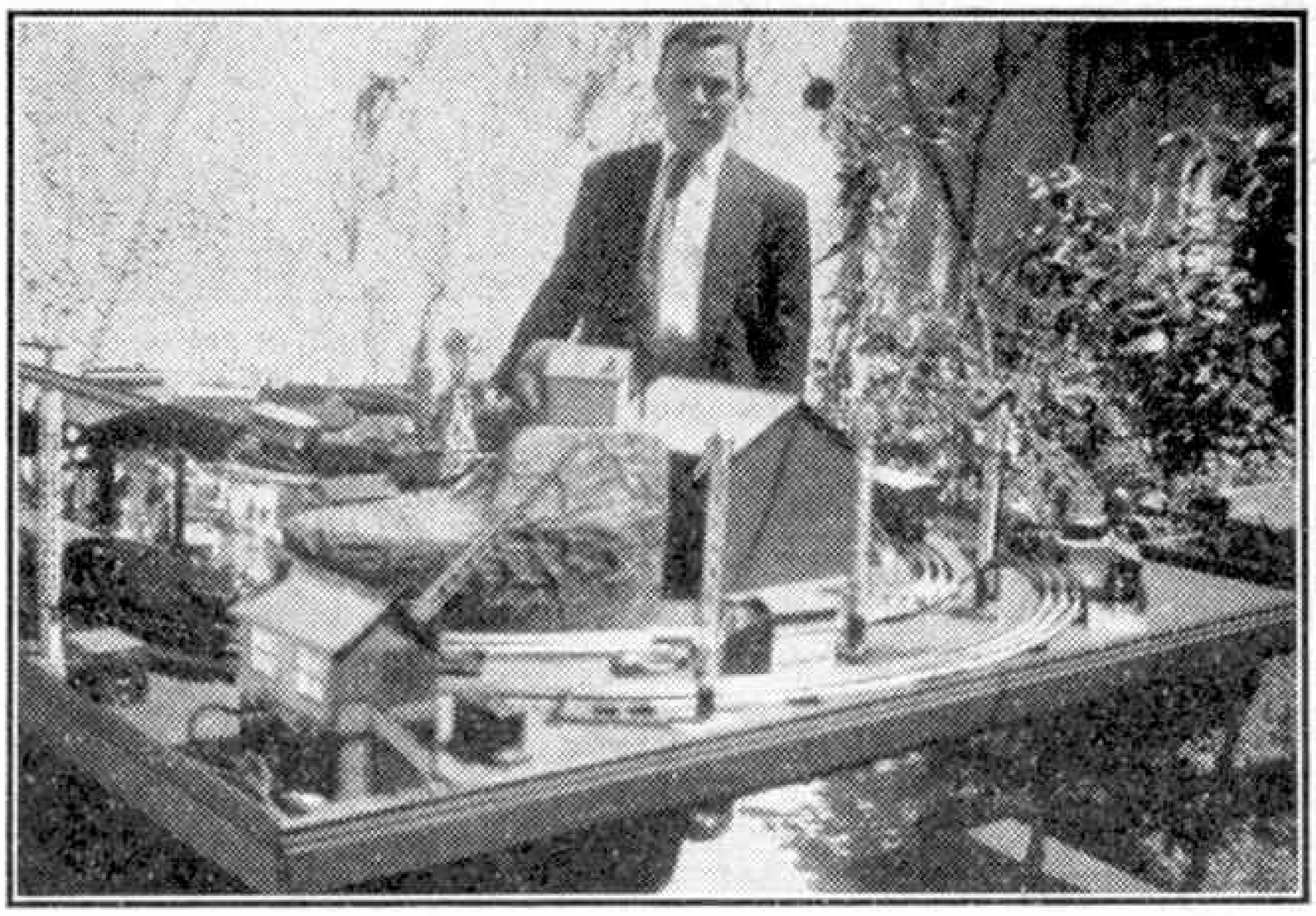
A SPECIALLY attractive feature of the miniature railway hobby is the varied character of the interests that it affords. The railway is by no means complete when all the track and equipment necessary for train working have been installed. Many of the layouts that have been described in these pages have provided ample evidence of the wide range of interests of their owners.

The three pictures that illustrate these notes show excellent examples of a number of interesting schemes that are different from each other in many ways. The first, seen on this page, shows overseas reader Guillermo Groezinger, of Rosario, Argentina, with his layout arranged for outdoor use. The railway is laid on a substantial baseboard, making it possible to move the whole system complete from indoors to outside and vice-versa.

In addition to stations and lineside buildings, which are essential to realism, the railway is well provided with signals, a point that is sometimes overlooked. Of the buildings, the Signal Cabin in the foreground of the illustration is prominent; note how this is placed so that it fills conveniently one of the corners of the baseboard. The corners of a miniature railway baseboard are usually the most awkward parts to deal with from the scenic point of view. In this instance the lower part of the Signal Cabin is made to accommodate some of the electrical gear required for the layout.

In the opposite corner, on the right of the picture, is a small wayside halt. Near this halt is a crane, which suggests the loading and unloading of freight vehicles. The handling of actual loads on a Hornby railway forms practically a subject in itself and operations become much more realistic if loads are carried in the wagons from point to point. All sorts of odds and ends can be pressed into use to make up suitable boxes, cases and so on. If these are duly "roped up" with Meccano Cord, or something similar, they can be slung from the crane hook in a fascinating manner.

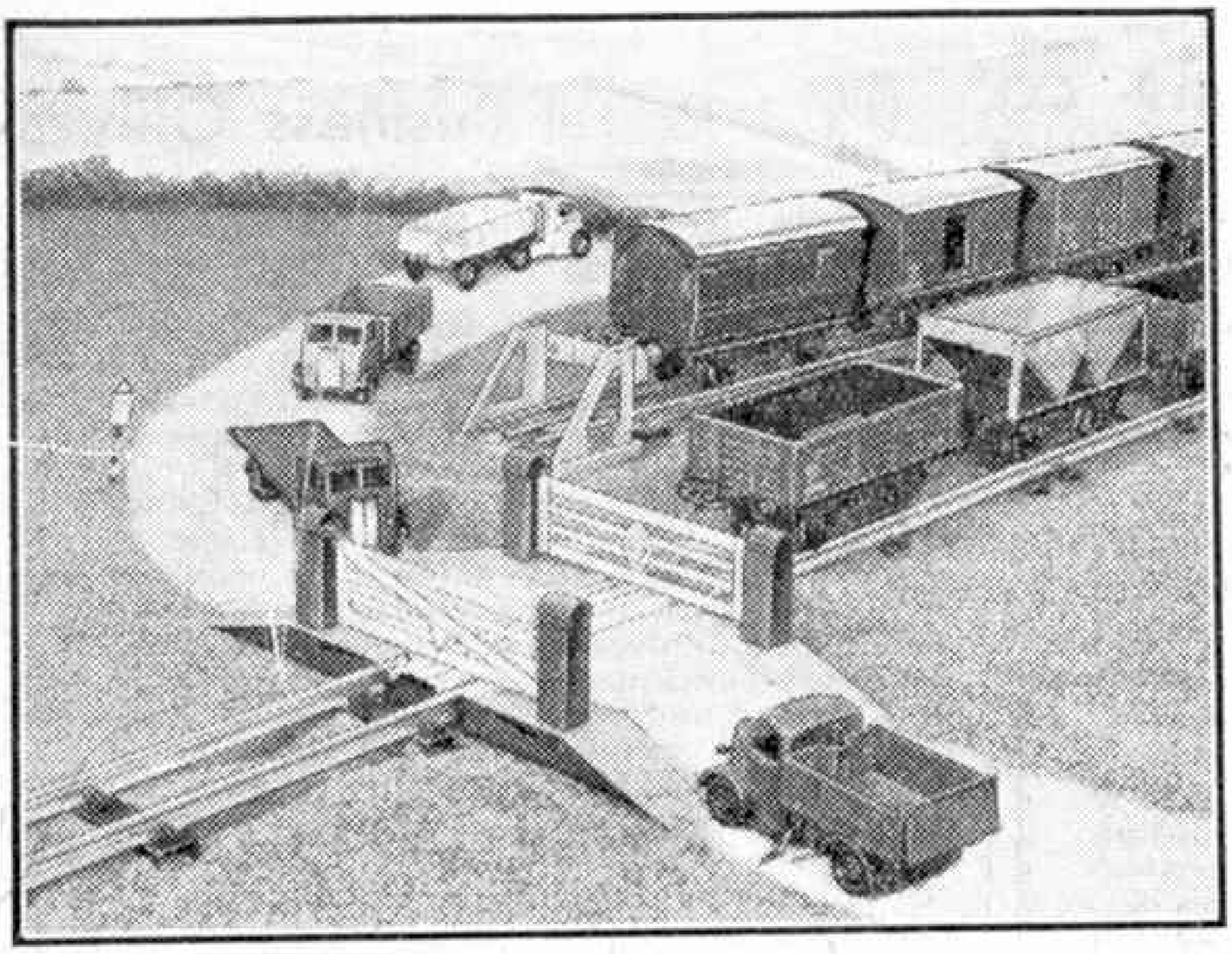
Some of the Meccano Dinky Toys make attractive loads, especially the models of agricultural character such as the Disc Harrow, Dinky Toys No. 27h. Loaded on Hornby Flat Trucks these items look most effective. Most Hornby railway owners nowadays make good use of Dinky Toys in connection with their railways. They are excellent for general road traffic and for use outside stations and in goods yards. Some of the larger vehicles, such as the Guy 4-ton Lorry, Dinky Toys No. 511, the Articulated Lorry, No. 521, and the Leyland "Comet," No. 531, are specially suitable for the road services associated with or actually operated by the railway authorities. Here again the topic of loads suggests itself, and the transhipment of different articles from road to rail and vice-versa can be a most entertaining part of the operations.



An overseas reader, Guillermo Groezinger of Rosario, Argentina, with his Hornby railway. This is laid on a special baseboard and incorporates numerous lineside details.

A load of a rather different kind is provided by the Hornby Container that is normally carried by rail on the Hornby Flat Truck. This represents a piece of real equipment specially designed for

road-rail transport, and the working of such traffic in miniature can be most attractive. The Guy 4-ton Lorry previously mentioned is exactly what is wanted for the road part of the journey, and its flat deck accommodates the Hornby Container with just the slightest amount of overhang at the rear end. The Articulated Lorry and the Leyland "Comet" mentioned previously will not take a Hornby Container, but there is no reason why the miniature railway owner who has these vehicles should not make up his own containers to suit them.



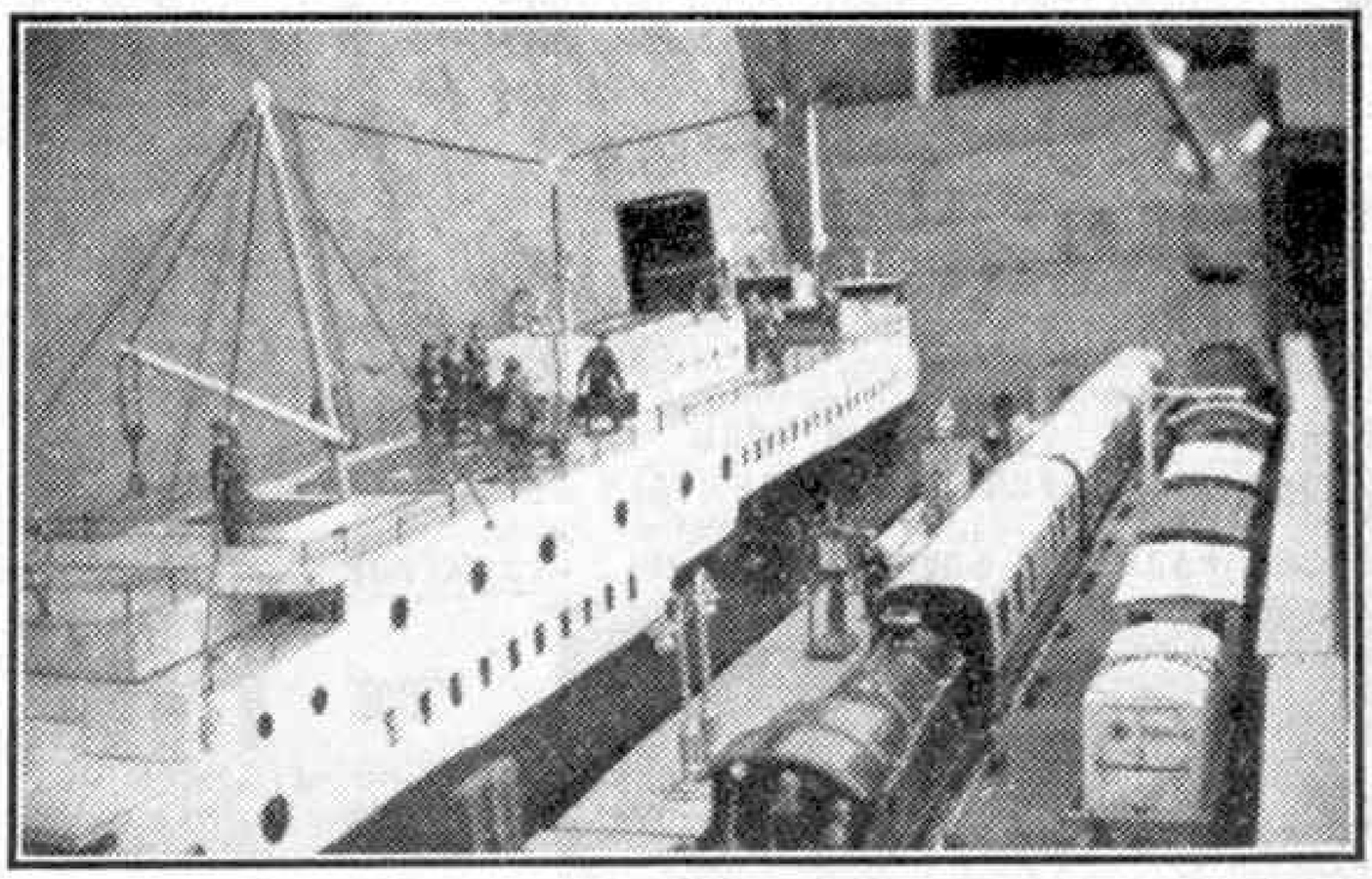
Dinky Toys road traffic on a Hornby Layout. The vehicle in the foreground is waiting until the lorries approaching in the opposite direction have passed the Level Crossing.

The actual road arrangements will vary according to the layout, the situation of stations, level crossings and so on, but effective schemes are possible even on small systems. The arrangement shown in the upper photograph on this page is of interest. The Level Crossing leads the road over the track connecting the yard with the main line, which is out of sight. Shunting movements take place on this connecting line, which explains the use of level crossing gates to ensure safety.

It is not often that a Hornby railway incorporates a quayside or dock, but when this can be done it is a most effective scheme. The lower photograph shows how Mr. F. A. Maxwell of Romford has fixed up a miniature "Marine" station. Here the railway platform forms the quayside as well so that the movement of passengers and baggage between the vessel and the train can be quickly and easily carried out. Arrangements of this kind involve the running of miniature boat expresses and there are many such trains on British Railways, the working of which can be reproduced in miniature. It is quite a lot of fun to operate on a Hornby railway an *"Irish Mail,"* a *"Channel Islands Boat Express,"* a *"Norseman"* or a *"Continental Boat Train."* The operation of freight trains in connection with steamer sailings will add variety to miniature boat train traffic. Open Wagons, Vans and Containers are particularly suitable for such working.

Operations of this kind will not necessarily be carried out by the engines that perform the main line run. There are sometimes restrictions that prevent main line locomotives from getting down to a particular waterfront and this part of the work may be performed by quite small tank engines. This provides for interesting working in miniature, one of the smaller engines of the Hornby system being kept for such duties.

The building of a miniature dummy ship should not be found unduly difficult by the average worker in wood or card. As an alternative a coloured illustration or drawing of a ship will have to do.



Boat train traffic on the layout of Mr. F. A. Maxwell, Romford. A quayside makes an interesting and unusual feature on a miniature railway.

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WRIGHT'S STAMP SHOP (M26), Canterbury, Kent

For other Stamp Advertisements see also pages 522 and xvi.

Stamp Collecting

More West Indies Pictorials

By F. Riley, B.Sc.

LAST month I illustrated and described the most recent stamp products of Dominica, one of the islands of the Windward group in the West Indies. Before we leave this part of the World, a great favourite with many stamp collectors and the home of many attractive pictorials, let us turn to the small island of Montserrat, in the Leeward group. The reason for visiting this island is that on 17th September last a fine long set of pictorials of the modern type was issued there. This consists of 13 stamps. One is a map stamp, and of the others each of the lowest six values is in one colour and those of the highest six are in two colours, printed in recess by the British firm of Bradbury, Wilkinson and Co. Ltd.

Montserrat is one of the most healthy and beautiful of the islands of the West Indies. Its scenery is varied in character and on it there are several hot springs as well as three active soufrieres or solfataras, which are hot jets of steam that in many instances give deposits of sulphur. Two-thirds of the land is mountainous, but the rest is well cultivated.

The island is only about 11 miles in length and 7 in breadth, but it has a population of over 13,000. Most of the inhabitants are negroes, but it was originally settled by Irish colonists, who moved there from the neighbouring island of St. Kitts early in the 17th century. Later it was conquered and held by the French, but it finally became British in 1784. Its chief town is Plymouth, in which there are about 2,200 residents, and there is a wireless station on the island.

It is now almost usual to include a map in a set of pictorial stamps, and this practice has been followed in the recent Montserrat issue. In this the map is on the 3c. value, in brown, and this stamp is interesting in itself, as well as a fine addition to any special collection of map stamps. Government House is pictured on the 1c. value, in grey, and also on the $2.40 stamp, which is in black with a green centre. Another well-known Montserrat building, St. Anthony's Church, is seen on the 5c. value, in mauve, and also on the 12c. stamp, in brown and blue, while the brown 6c. value and the $4.80 stamp, in black and violet show the badge of the Presidency of Montserrat.

The use of this word Presidency is interesting. The Leeward Islands of the British West Indies consist of four Presidencies, the remaining three being Antigua, St. Christopher and Nevis, and the Virgin Islands. The first two of these Presidencies, together with Montserrat, have their own local legislatures.

Following the usual custom, the set includes stamps that illustrate the chief products of the island. The 4c. stamp, in carmine, illustrates the picking of tomatoes, which grow luxuriantly in the favourable climate, and the 24c. value carries the same picture in green and carmine. Besides tomatoes limes are grown largely on the island, and lime products made from them are among the chief exports.

A more important product that is largely exported, and indeed accounts for the greater part of the wealth of the island, is cotton. This is of a special type known as sea island cotton that grows well in the happy climate of these islands and is remarkable for its long staple, which may be nearly twice that of American cotton. The 2c. stamp, in green, illustrates the cultivation of this crop, to which very careful attention is given, and the same plantation is illustrated on the $1.20 stamp which, as usual with the high values, is in two colours, in this case blue and a yellowish green.

When the cotton is picked it has to be separated from the seeds that it contains. This process is called ginning, and is carried out in specially designed machines. One of these machines is seen at work on the 8c. and the 60c. values, the former in indigo and the latter in red and black.

All the 13 stamps of the series are horizontal, like the examples shown on this page, and in each case the portrait of the King in an oval vignette forms part of the design. As readers will have gathered, apart from the map stamp the designs are grouped in pairs, each having assigned to it a low value and a high value, but these differ in such points as the placings of the portraits, the surrounds and the value. For instance, the 5c. value differs from the 12c. value in having the King's portrait on the left instead of on the right, the pictorial feature of the design, St. Anthony's Church, being the same in each case. This church is claimed to be the second oldest in the British West Indies.

The stamps are recess printed, well produced, and form a useful and interesting, although orthodox addition to the large number of pictorial issues now available.

BULGARIA NEW TRAIN FREE

ABSOLUTELY FREE. This beautiful brown **BULGARIA** showing Modern Railway Engine and Train which has been issued to commemorate the Bulgarian Railway Jubilee, a lovely stamp which will add value and interest to YOUR COLLECTION. In addition, we will also send you Absolutely Free, **AUSTRALIA** (Queen Elizabeth), nice **JAMAICA** (West Indies) and a very old stamp from **INDIA.**

Just write for **Bulgarian New Train Packet Free** and ask to see a **Selection of Windsor Stamps On Approval** (no obligation to purchase any). Please send 2½d. stamps for our posting costs to you.

WINDSOR STAMP CO. (Dept. M), Uckfield, Sussex

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Fiji Health, etc. FREE! Just issued. **Fiji Health** and **New Montserrat pictorials both absolutely FREE.** Request **NORTHERN BARGAIN APPROVALS** with Discount and Free Gift Scheme. 2½d. stamp please. **Write Now! NORTHERN STAMP COMPANY, 8, Rowan Place, New Earswick, York**

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to every applicant for approval books. The GIFT contains 30 British Colonials including 8 K.G. VI mint—no Great Britain. Good discount is given and a list of 98 Gifts is sent. These can be chosen by you and vary in value according to the money sent for purchases. They include K.G. VI Silver Jubilees; ALL the Colonial Victory sets mint; and Foreign stamps. 3d. postage please.

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For other Stamp Advertisements see also pages 520 and xvi.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

THERE can be few stamps that are of more interest to junior collectors, and to a lot of seniors as well, than those of the Pitcairn Islands. So the emission on 1st September of two new values was quite an event for many, particularly as one of the stamps, the 8d. value, depicts a school, which they as collectors bought through their purchases of Pitcairn Island stamps.

Yes, that school was bought and paid for by the profits earned from the sale of postage stamps. One philatelic writer has been very caustic about all this, for recently the Crown Agents announced that Tristan da Cunha is to have a set of stamps, and for the purpose those used by St. Helena, up to the 10/- value, are to be overprinted "TRISTAN DA CUNHA." This writer said that if a set to 2/6d., which is as far as the set goes for Pitcairn Islands, will provide a school, Tristan da Cunha must be after a University when she goes in for a set to half a sovereign! Without a doubt, it really is overdoing it to provide a set that has a total face value of over a pound, and I am rather of the opinion that these stamps will never be particularly popular in consequence. By the way the other stamp to be issued by Pitcairn Is. shows a picture of the "*Bounty*" Bible.

The news of the set for Tristan da Cunha was quite a surprise, and so was the appearance on 1st August of the 10c. stamp for Ceylon. The Crown Agents, in the first instance, merely reported a new 10c. stamp, but not a word was said until the last moment about a foreign printer doing the job. Yet so it proved, and when the stamp actually appeared it was found to be one of those photogravure issues that the Swiss firm, Messrs. Courvoisier, turn out so slickly. This is only the second stamp emitted since the beginning of this century by any country in the Commonwealth that was not printed within the Commonwealth itself.

Was the change worth while? To my taste no, for to me the palms look more like sweep's brooms than anything else—and that gum! Watch your stamp doesn't stick to the page. Messrs. Courvoisier do turn out some striking stamps, but this latest issue of Ceylon can hardly be placed in that category.

Collectors should note the paper of the stamp. It is of the security type, and apparently a patent of the firm in question, for fine threads of blue and red fibre will be noted in the texture. Speaking of paper, several collectors have asked what is meant when "substitute" paper of KG. VI issues is referred to. Messrs. De La Rue, the British firm of stamp printers, used a paper that had a fine coating of chalk etc. This resulted not only in a fine impression, but also in the impossibility of cleaning off a postmark without removing some of the design. Thus the "chalky" paper, as collectors called it, was another kind of security paper.

Some years ago, two new kinds of paper were introduced, one with a slight coating of some substance, and another with no coating at all, and these have become known to collectors of KG. VI stamps as "substitute" paper. While they look alike, they can easily be distinguished as follows. First get an old silver coin. It must be old—any one with the head of Queen Victoria or King Edward VII will do—for modern coins are not pure enough. Then rub the stamp lightly, and if a mark is left that looks like one made by a lead pencil, you have a stamp printed on "chalky" paper. If no mark at all is left, or only a very faint one, then it is almost certain that your stamp has been printed on "substitute" paper.

Our third illustration is of a stamp that is part of a set of three issued by Eastern Germany, described as depicting the liberty bell, wherever and whatever that may be. This territory is bringing out a new set or even more than one every week, which contrasts with the fuss we make about producing a few stamps.

Great interest is being aroused in the forthcoming set of stamps to be issued in dollar currency by the "United Nations." The two first values were designed by a Mexican and a Dutch artist respectively, and are being printed in Holland. British stamp printers and designers have not been overlooked, and other values will not only be printed in England, but the designer of a British firm of printers will be responsible for at least one of the designs. As they will be in dollar currency collectors will not be able to order direct from America, but British stamp dealers will obtain supplies by barter, so there will be no difficulty in getting hold of a set, if you can afford the money—over £1 for a complete set. As the stamps will be very popular and many will be bought, they are hardly likely to prove a good investment, unless the unexpected happens, but postally used specimens should prove rather scarce.

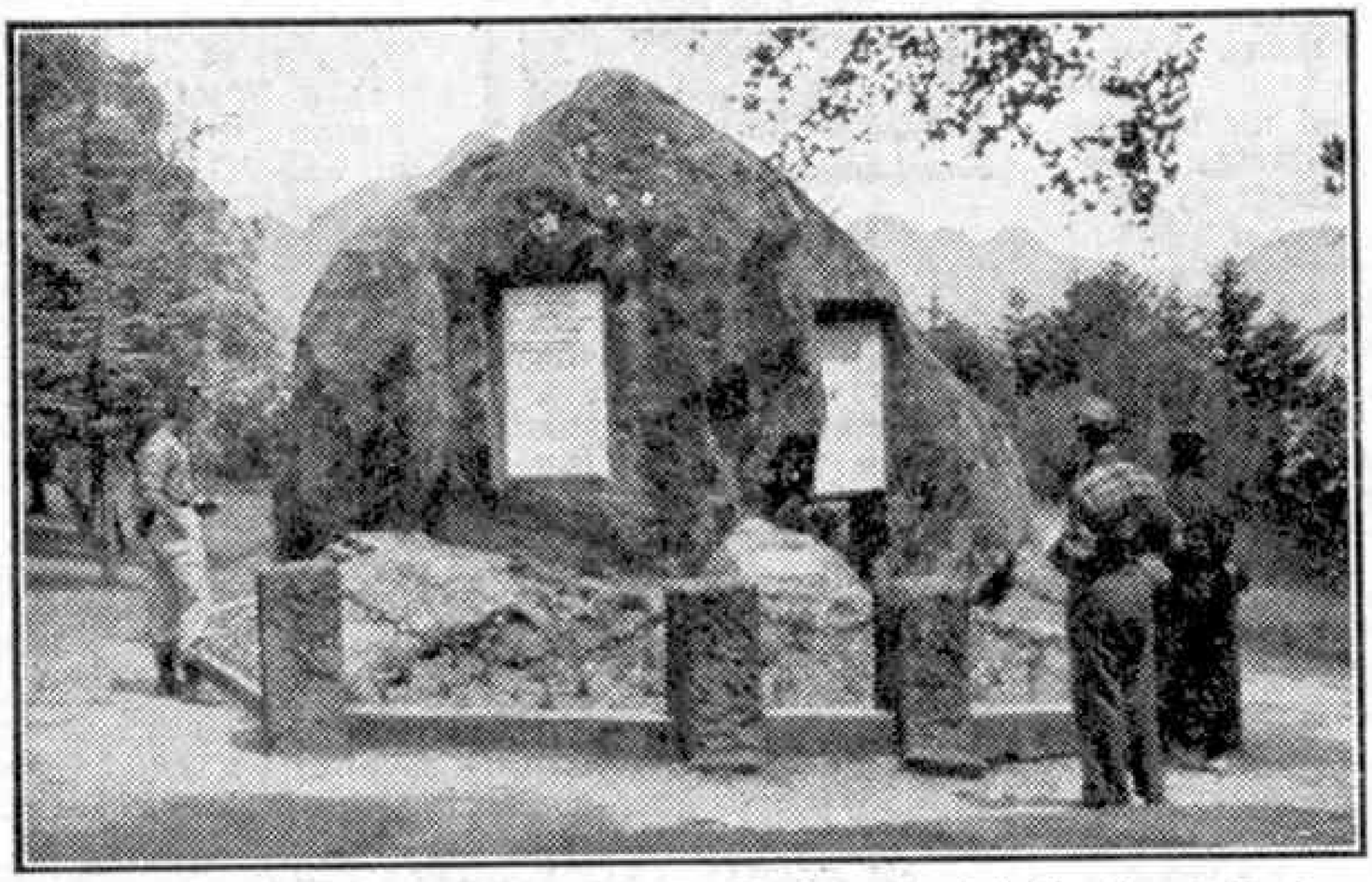
Several stamps have been issued to commemorate Boy Scout Jamborees, but it has been left to Austria to produce the finest of them all. Hungary was the first to issue special stamps in 1933, followed by Holland in 1937 and France in 1947. All these stamps had points of interest, but Austria's contribution is outstanding and it is a pity that the black and white illustration does not show the beauty of the colouring. To see how far British commemorative stamps fall short of those of Austria, just place a copy of this gem alongside our 2½d. Festival effort.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A SCOTT MEMORIAL

Queenstown, New Zealand, one of the most popular tourist centres in the world, nestles in a sheltered



The memorial at Queenstown, New Zealand, to Captain Scott and his four comrades who reached the South Pole in 1912, and perished on their return journey. Photograph by John C. Mauger, Temuka, N.Z.

corner of Lake Wakatipu between the towering jagged 8,000 ft. Remarkables and lofty Ben Lomond. Holiday makers prepare for trips here into the wild scenic grandeur at the head of the lake, skiing on Coronet Peak, and climbing the mountains.

In Queenstown itself a short peninsula has been converted into a picturesque domain, at the end of which stands the large glacial boulder seen in the upper illustration on this page. Senior Cadets of the 42nd Coy. have faced this stone with tablets in memory of the ill-fated party led by Captain Scott, which met disaster on returning from the South Pole in 1912. It commemorates also the gallant deed of Captain Oates, who walked out into a blizzard to die in the hope that the rest of the party would then reach safety.

The well known quotation from St. John: *"Greater love hath no man than this, that a man lay down his life for his friend,"* appears at the foot of one inscription; on the other is the epitaph: *"They rest in the Great White Silence of Antarctica amid the scenes of their triumphs wrapped in the winding sheets of the eternal snows. Sub Umbra Crucis."*

JOHN C. MAUGER (Temuka, N.Z.)

AN EARLY BRITISH LIGHTHOUSE

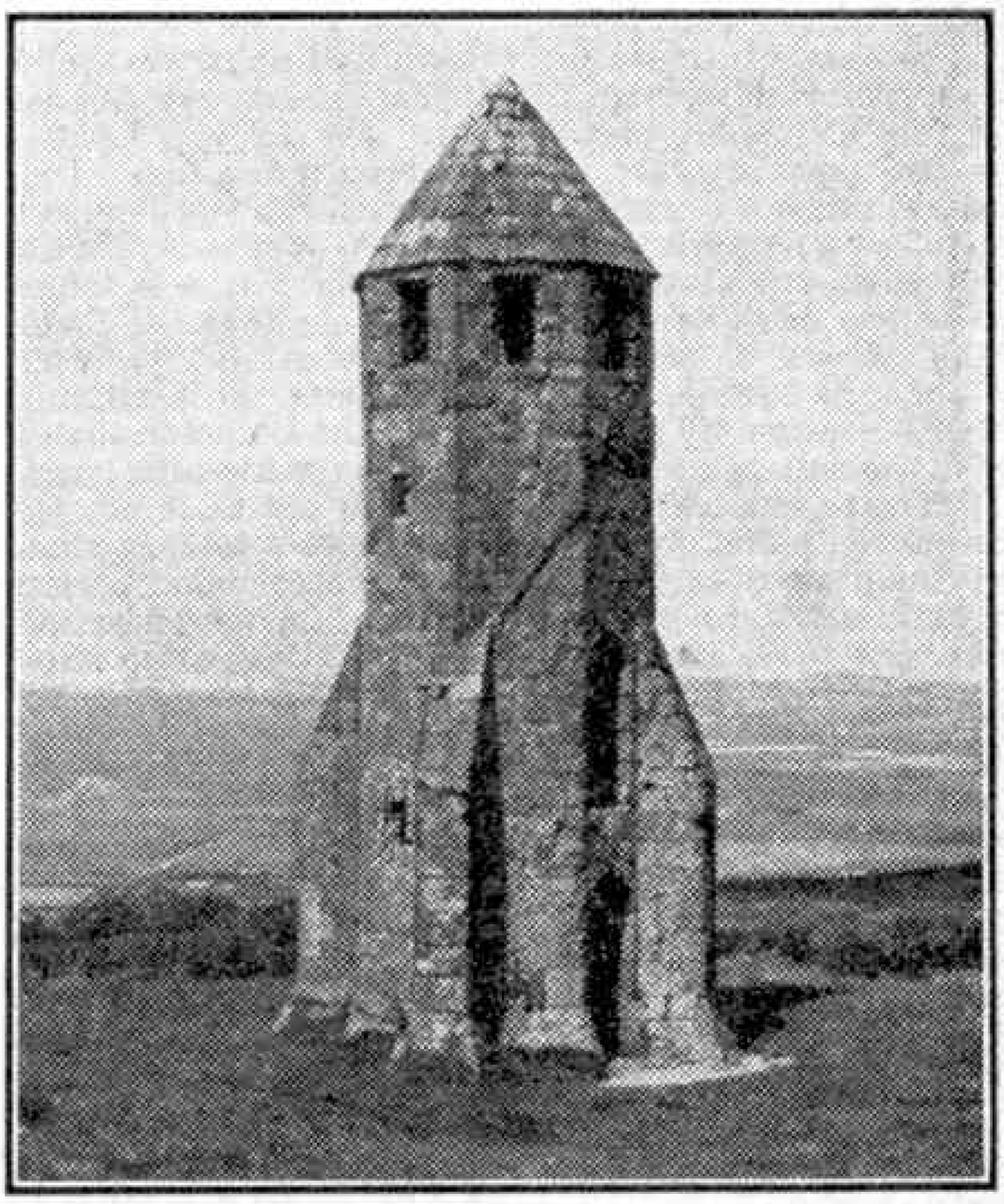
The accompanying photograph shows what must be one of Britain's oldest existing lighthouses. It was built in the 14th century on St. Catherine's Hill, near Chale, Isle of Wight, with the object of assisting mariners sailing off the treacherous coast of Chale Bay.

The story of how it came to be built begins in the year 1314, when the *"St. Marie,"* a French ship laden with white wine, went ashore off Atherfield Point. The crew of the ship then proceeded, quite illegally of course, to sell the cargo.

One of the recipients of this wine was a man named Walter de Godeton, who with several others was eventually caught and charged with illegal possession. He was fined heavily, but it must have been during his trial that a rather unusual point came up. It transpired that the wine came originally from a monastery and when the Pope heard of this, he threatened de Godeton with excommunication. He relented, however, but only on condition that de Godeton built a lighthouse-cum-oratory overlooking the notorious southern coastline of the Isle of Wight, wherein a priest might keep a light burning and also pray for those sailing the seven seas.

De Godeton carried out this order and the result is the little building that we can still see to-day. The tower, although only 36 ft. high, consists of four storeys. The doorway at the base led to the priest's personal room, and the room above served as a chapel. The two upper storeys where the light was displayed had no steps leading to them, and therefore could only be reached by means of ladders! The light was kept burning for over 200 years, but at the dissolution the tower came under the heading of a monastic building and was "suppressed," and its only use then was as a useful navigation point.

W. F. BUNCE (London W.2).



St. Catherine's Tower, near Chale in the Isle of Wight. Photograph by W. F. Bunce, London W.2.

Competitions! Open To All Readers

Prize-winning entries in "M.M." competitions become the property of Meccano Ltd. Unsuccessful entries in photographic, drawing and similar contests will be returned if suitable stamped addressed envelopes or wrappers are enclosed with them.

Modern Inventions Competition

This is an age of immense progress in all branches of science and engineering, many of which have helped wonderfully to make our lives easier and brighter.

The past 50 years have been very rich indeed in inventions of all kinds. Some of these have been of outstanding importance, and in connection with many of them that have had far-reaching effects it is interesting to consider the problem of whether their introduction has really been an unmixed blessing. With this in mind we are giving readers an opportunity of expressing their opinions on the values of a few select introductions of the last 50 years.

1. TELEVISION
2. ATOMIC POWER
3. MODERN PLASTICS
4. THE AEROPLANE
5. THE GYRO COMPASS
6. THE THERMIONIC VALVE
7. RADAR
8. STAINLESS STEEL

The panel on this page contains a list of eight important inventions of the present century. Every entrant in the competition is asked to say A, which of these he thinks has brought with it the greatest benefit to mankind, and B, in what order he thinks the popular vote of entrants in the competition will place the eight inventions. It is not necessary that a competitor should place the invention of his own choice at the head of the list under B.

There will be the usual two sections in this contest, for home and overseas readers respectively, and in each section there will be prizes of 21/–, 15/– and 10/6 for the entries judged to be the best. In addition there will be consolation prizes for other good efforts, and in the event of a tie for any place the judges will rely on the neatness or the originality of the entries themselves in making their decisions.

Entries should be addressed *"Modern Inventions Competition, Meccano Magazine, Binns Road, Liverpool 13."* Closing Dates: Home Section, 31st December; Overseas Section, 31st March, 1952.

Name these Locomotive Parts

Here is a splendid chance for *"M.M."* readers who know anything about locomotives to win handsome prizes. The competition is a very simple one, in which the names of 12 locomotive parts are concerned. What these parts are is indicated by the 12 clues shown below, and readers will find it easy and interesting to discover them.

Here are the clues, numbered in order:

1. Ensures plenty of oil.
2. May prevent a fall.
3. Must be closed tightly.
4. Sounds like a Russian prairie.
5. Causes a splash.
6. Made in different pitches.
7. Clear the driver's vision.
8. Two-wheeled carrier.
9. Air pressure builder.
10. A season for smooth riding.
11. Driver changes direction with it.
12. Sought by spotters.

When entrants have tracked down the parts that they think satisfy the conditions, they should make a numbered list of their solutions, and send it to *"November Locomotive Parts Contest, Meccano Magazine, Binns Road, Liverpool 13."* Each sheet of the entry also must have on it the name and address of the competitor.

There will be two sections, for readers at home and overseas respectively, and in each prizes of the value of 21/–, 15/– and 10/6 will be awarded for the three best entries in order of merit. In addition there will be consolation prizes for other good efforts, so no reader should fail to send in his solution, even if he himself is not completely satisfied with it. If there is a tie for any prize the judges will take the neatness of the entries and their originality into account in making their decisions.

Closing dates: Home Section, 31st December; Overseas Section, 31st March 1952.

November Photographic Contest

The eleventh of our 1951 series of photographic contests is a general one, in which we invite readers to submit prints of any subject. Each competitor may submit only one photograph, which must have been taken by him, and on the back of his print must be stated exactly what the photograph represents.

The Competition will be in two sections, A for readers aged 16 and over, and B for those under 16. Each competitor must state in which section his photograph is entered. There will be separate Overseas Sections, and in each section prizes of 21/–, 15/– and 10/6 will be awarded. Entries should be addressed *"November Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13."* Closing Dates: Home Section, 30th November; Overseas Section, 29th February, 1952.

Building a New Oil Jetty—(*Continued from page 485*)

concrete required for this purpose is 4,500 tons.

To secure tankers making use of the jetty there will be 11 bollards on the head, and in addition mooring posts are being constructed upstream and downstream. Ground moorings consisting of screw piles, to which are attached bridle and pendant chains of about 3 in. cast steel secured to buoys, are being provided to take the head and stern ropes of the vessels.

Pipelines for the oil will be laid to headers on the jetty, and Samson posts with double derricks and electric winches are to be installed to deal with the suction hoses through which oil will flow from or into vessels alongside. There also will be water and steel pipes, telephone lines and lighting cables.

The New R.A.F.—(*Continued from page 490*)

best equipped sections of the R.A.F. When re-equipment is complete, pilots will begin their training on "Chipmunks" and the new Percival "Provosts," graduate on to "Balliols" and then pass on to "Meteor" 7, "Meteor" 10, or "Varsity" operational trainers—all of them the finest aircraft for the job.

This then is the blue-print for the new Royal Air Force—Britain's first line of defence in a troubled world. It is strangely reminiscent of the formations which faced the *Luftwaffe* in 1939–40. The Hawker "Hurricane" and Supermarine "Spitfire" have their modern counterparts in the P.1067 and "Swift" from the same companies. Our standard "heavy" in 1940 was the "Wellington," built by Vickers, whose "Valiant" is in production now. For over-water patrol the Avro "Anson" is succeeded by the Avro "Shackleton"; and just as we then had Lockheed "Hudsons" to share their work, so we shall soon have Lockheed "Neptunes."

This is important, for it means that our new warplanes have behind them a tradition of achievement and experience second-to-none in the world. But the British aircraft industry has never let tradition stand in the way of progress; and the fact that we now have more deltas and other revolutionary research machines flying than even the United States augurs well for the future.

Among the Model-Builders—(*Cont. from page 513*)

Angle Bracket is fixed to one end of each brake shoe and is bolted tightly to the Face Plate as shown in Fig. 4 (page 513). A second Angle Bracket 4 is attached to the free end of the shoe.

The brake is applied by depressing a pedal 5, consisting of a Threaded Crank pivoted on a ½" Bolt fixed to the chassis. The Threaded Crank is linked by a Rod held in a Collar to a Coupling 6 that pivots on a bolt fixed in a Double Arm Crank 7. The Double Arm Crank is carried on a Rod mounted across the chassis, and a second Double Arm Crank is fitted at the other end of the Rod.

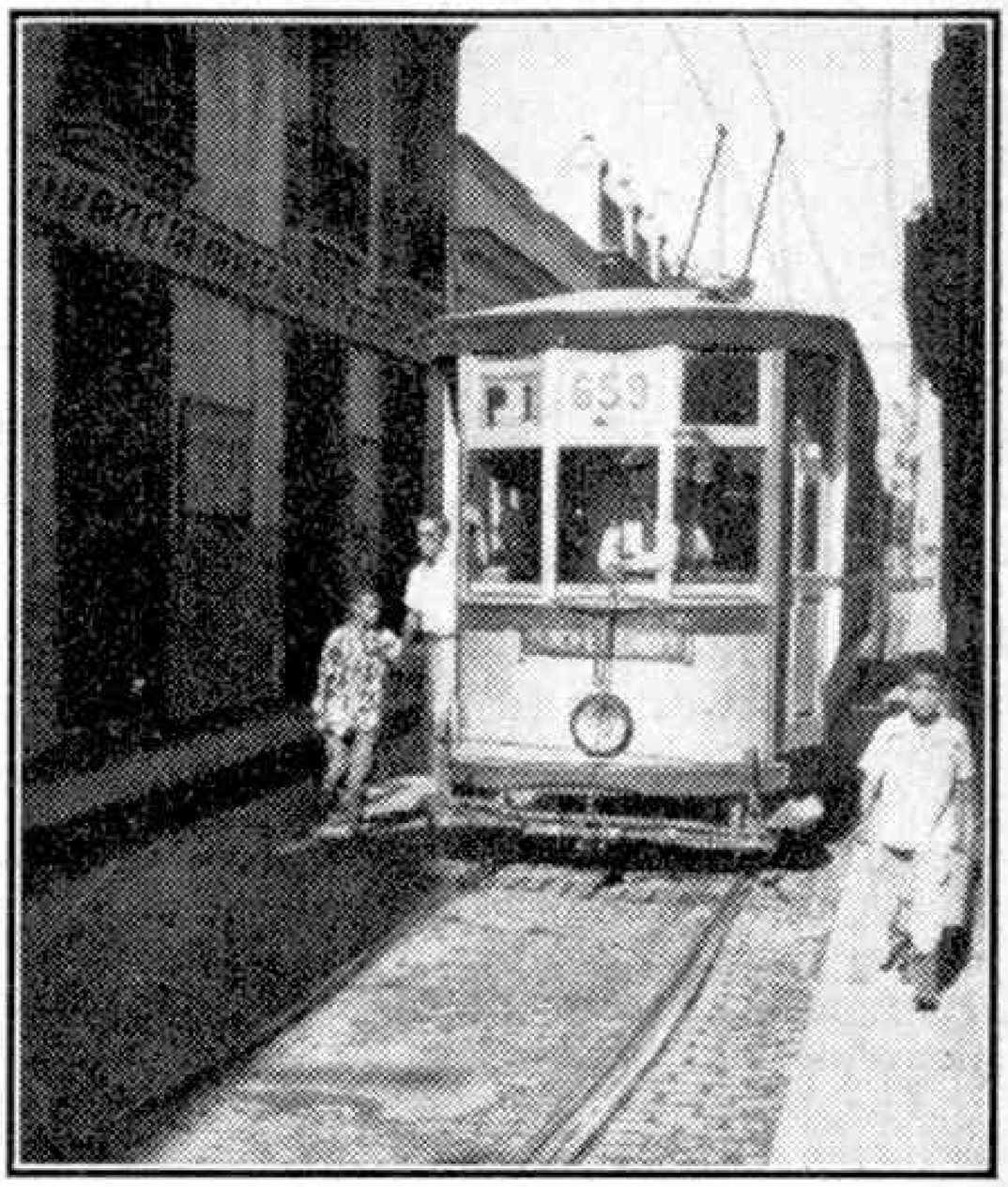
A length of wire is fixed to each Double Arm Crank, and is passed through an outer core of Spring Cord. One end of the Spring Cord is fixed in a Collar attached by a bolt to the chassis, and the other end is similarly fixed to the Face Plate. The free end of the control wire is attached to Angle Bracket 4.

A Trip on a "Trial Engine"—(*Cont. from page 506*)

in water from the troughs beyond. Our first check came just south of Carlton. It became a dead stand and so down we went once more. The troublesome box was definitely cooling off. That little something that was irritating it had finally been overcome.

All aboard and off for another gallop. Another hasty look around at Gamston and we could congratulate ourselves; she was almost perfect, or would be by the time we reached home. As we neared Doncaster the "boards" began to be on. We were fortunate in keeping to the main line all the way past "*Carr Loco*," but we were held at Balby Bridge colour lights and once again we went down to inspect. The right driving box was now only warm, nothing to worry about at all, but the left driving box had become warm too!

We entered the Plant Yard via South Yorkshire signal box and got back to the Weigh House about 6.30 p.m. Driver Tacey made out a report of all that had happened, this report being later available for the repair shop foreman. There is nothing like a trial run for showing if "*she'll do.*" With "*Lemberg*" a second trip was ordered, on which the engine was galloped both ways; no trouble was experienced, she came home cool in all bearings, and so another engine was ready for traffic.



Tramcar in a narrow street in the old section of Havana, Cuba. Photograph by C. E. Keevil.

New Meccano Models—(*Continued from page 515*)

by two Trunnions. The Trunnions are held together by a ⅜" Bolt passed through the centre hole of their flanges and fixed in place by a nut. The shank of the bolt is then passed through the Flanged Plate and fitted with lock-nuts, so that the unit can be turned to steer the model.

The jib is supported by a 5½" Strip 1 on each side, braced by a Curved Strip 2 and a 2½" Strip 3. The jib supports are linked by a 2½" × ½" Double Angle Strip 4.

The jib consists of two 5½" × 1½" Flexible Plates joined at each end by a U-shaped bracket assembled from two Angle Brackets. The Plates are extended by 5½" Strips braced by 2½" Strips 5, and the outer ends of the 5½" Strips are connected by a ⅜" Bolt 6.

The luffing movement is operated by a length of Cord tied to a 2" Rod 7. This Rod is mounted in one of the Strips 3 and in a Reversed Angle Bracket, and it carries a Bush Wheel fitted with a ⅜" Bolt as a handle. A Spring Clip on the end of the Rod prevents the Cord from slipping off the winding shaft.

The Hook is fastened to Cord attached to a Crank Handle mounted in Strips 1.

Parts required to build the model Mobile Crane: 2 of No. 2; 4 of No. 5; 1 of No. 10; 4 of No. 12; 2 of No. 16; 2 of No. 17; 1 of No. 19s; 4 of No. 22; 1 of No. 24; 4 of No. 35; 22 of No. 37; 4 of No. 38; 1 of No. 40; 2 of No. 48a; 1 of No. 52; 1 of No. 57c; 2 of No. 90a; 3 of No. 111c; 1 of No. 125; 2 of No. 126; 2 of No. 126a; 2 of No. 142c; 2 of No. 155; 2 of No. 189.

Fireside Fun

"Please will you pull this nail out of mother's slipper."

"Of course, my boy. It must have hurt her very much."

"No, it hurts me when she spanks me."

* * * *

"I've been in a much worse fog than this, chum."
"Where?"
"I dunno. It was so foggy!"

* * * *

"How is that unmarried brother of yours getting on?"

"When I saw him yesterday he was mending slowly."

"I didn't know he had been ill. What was the matter?"

"Nothing, really. He was just darning his socks."

* * * *

"A brave soldier never hesitates to go where the bullets are thickest to do his duty. Have you got that? Now, Private Smith, what would you do if this camp were attacked by the enemy?"

"Jump in the ammunition lorry, sir."

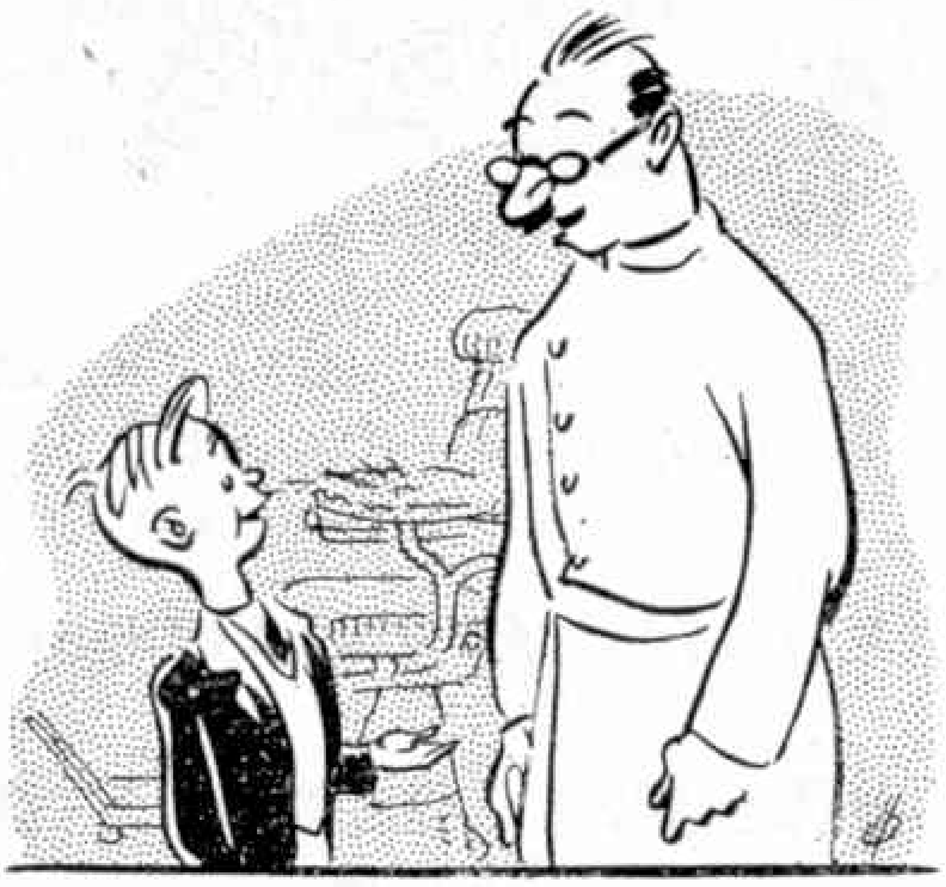
* * * *

"Try a few steaks from this cod, madam."

"I don't think so. I don't like the look of it."

"Oh, if it's looks you're after, mum, why not buy a goldfish?"

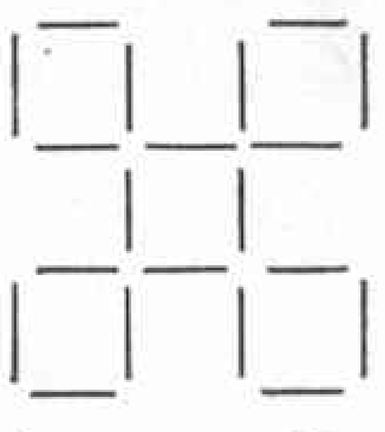
* * * *



"Can I have the toof, please?"
"Whatever for?"
"I just want to put sugar on it and watch it ache!"

BRAIN TEASERS

SQUARING THINGS UP



Sharp-eyed readers have pointed out that the solution in the September "*M.M.*" of the August match puzzle gives three squares, not two. The correct solution is shown at the foot of the page.

One reader who pointed this out offered the following simple match puzzle. In the accompanying diagram, each line represents a match and there are five squares. Now add four matches and make fourteen squares. J.B.

* * * *

STUPIDITY AMONG THIEVES

There is an old story of two thieves who for some reason decided to steal the two bell ropes of the twin bells in their church tower. Each climbed up a rope. One man cut his rope above his head, fell and hurt himself severely. The other thief laughed and said "You should have cut the rope below your hands." He did this himself and then found himself dangling in space, with no escape except by dropping to the floor, like his comrade.

These thieves were not smart enough to solve a Brain Teaser problem, which is simple. How could the two ropes be removed by one man in safety?

S.W.C.

* * * *

"The cops are coming—jump through the window."
"But this is the thirteenth floor!"
"It's no time to be superstitious."

* * * *

A SAD STORY

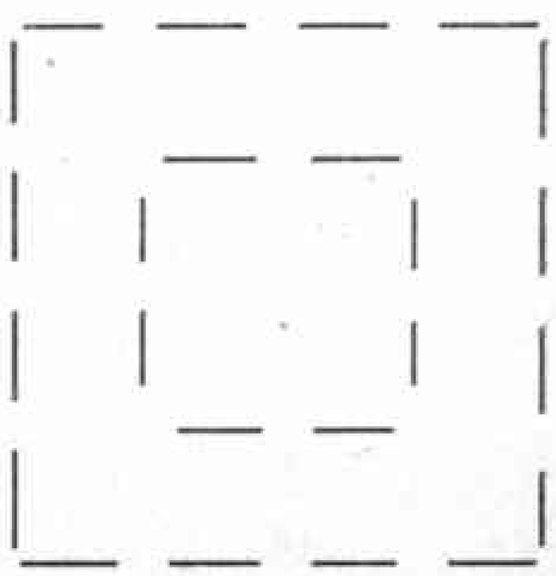
Twice four, and twenty rabbits
Were sitting in the rain.
I shot and killed a seventh part.
How many did remain?

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The trick that solves our first puzzle last month is to convert 10 horses into TEN HORSES. The nine letters then fit into the squares conveniently provided.

The multiplication sum of our second puzzle was not perhaps easy to work out, but no doubt many readers will have found the following solution:



```
    3 3 7 0 4
        2 7 1
  -------------
    3 3 7 0 4
2 3 5 9 2 8
6 7 4 0 8
  -------------
9 1 3 3 7 8 4
  -------------
```

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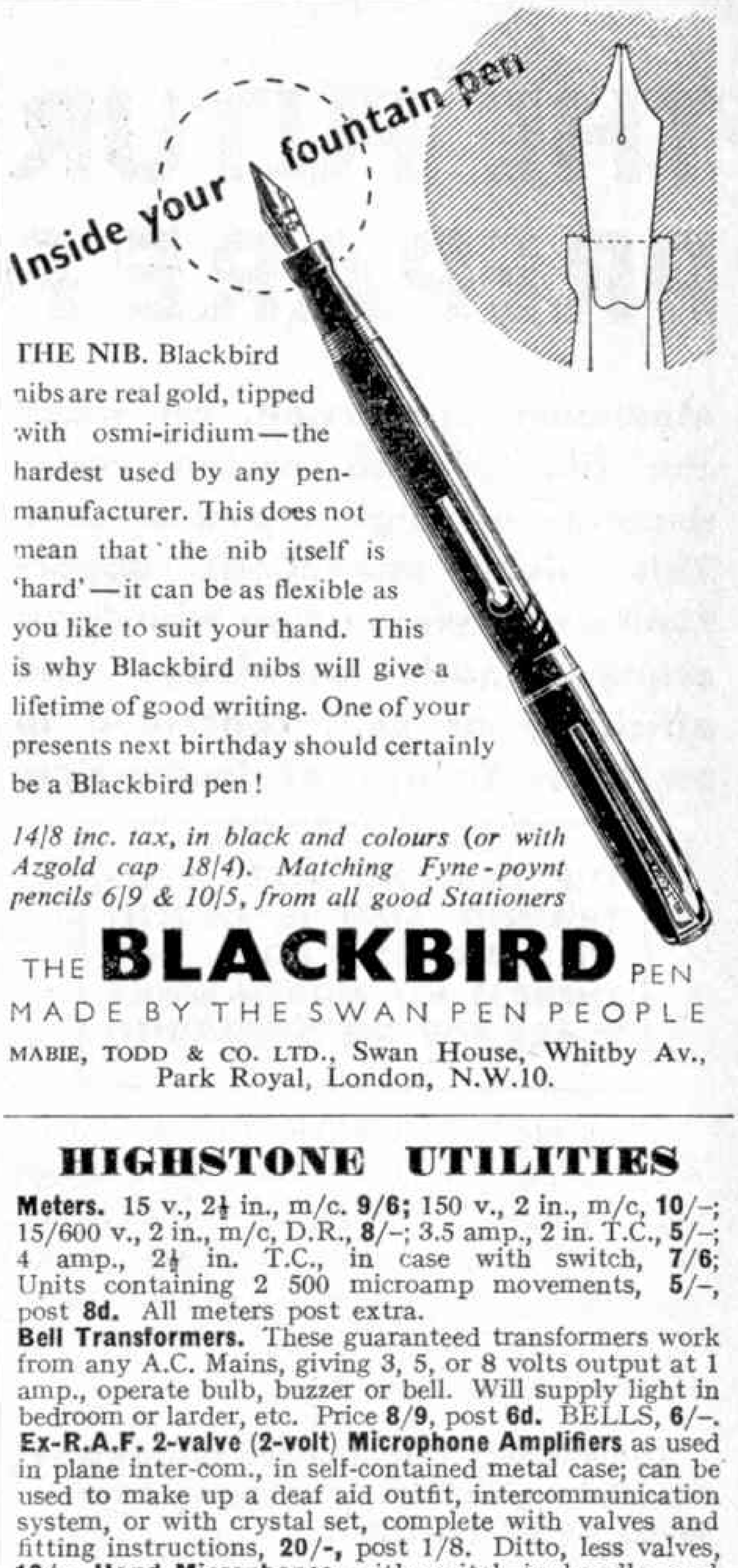

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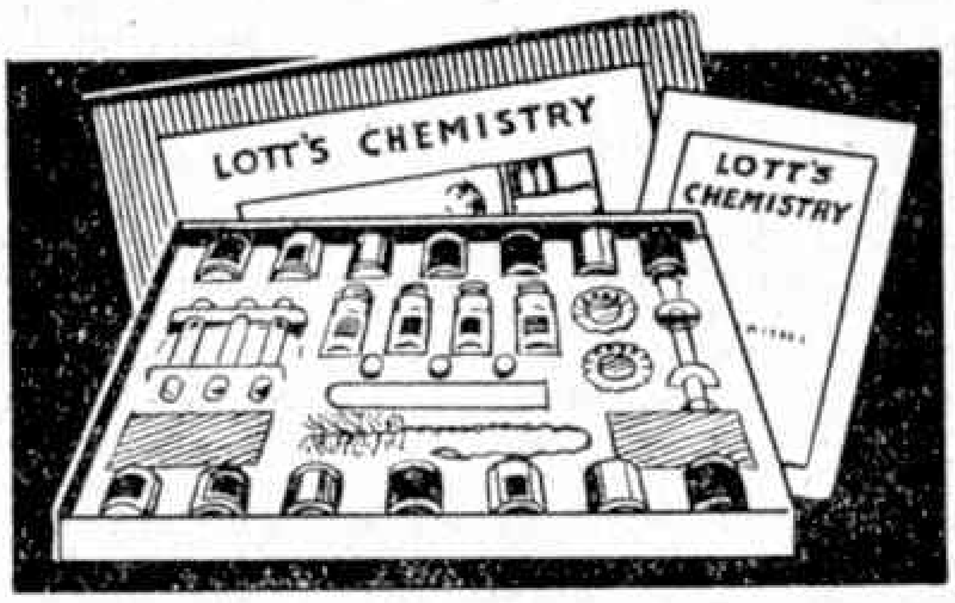

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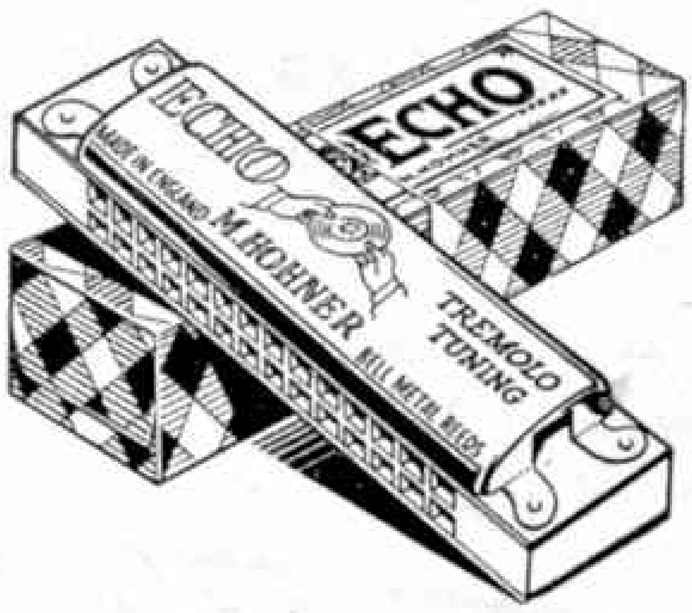

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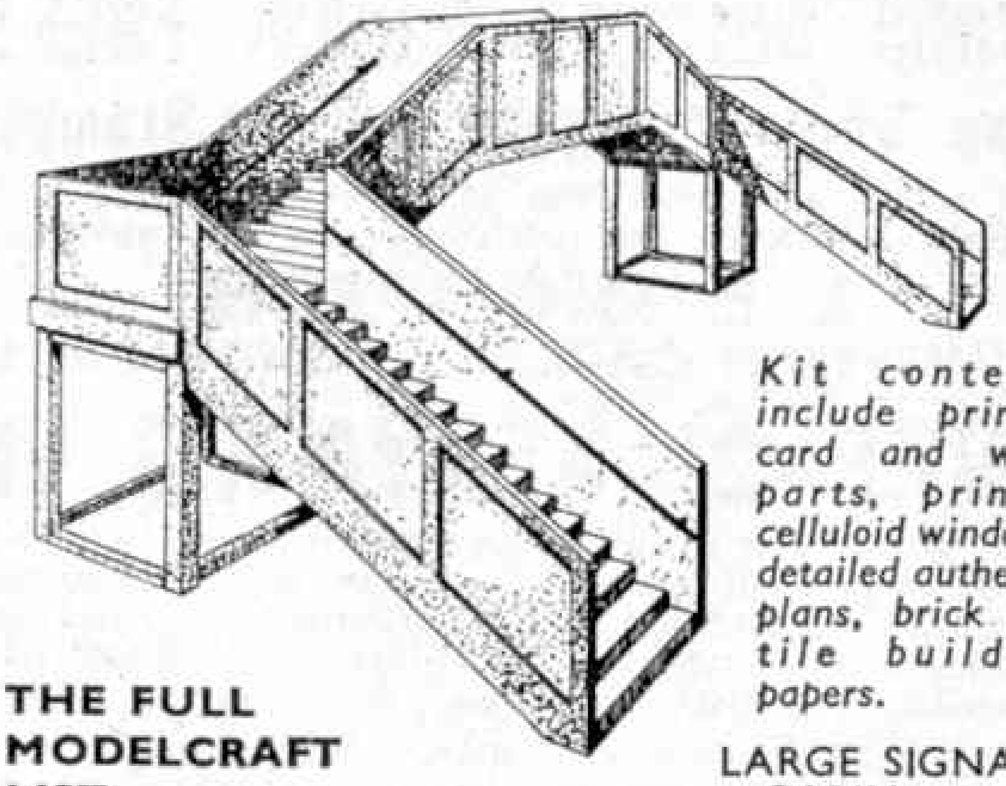

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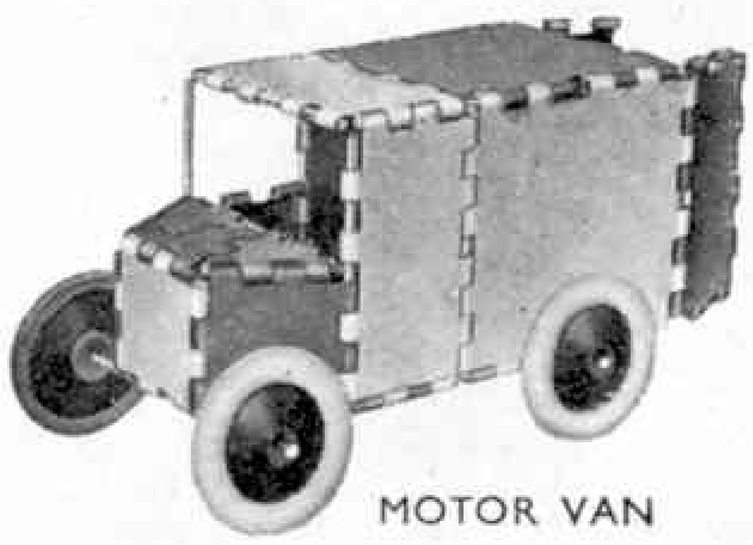

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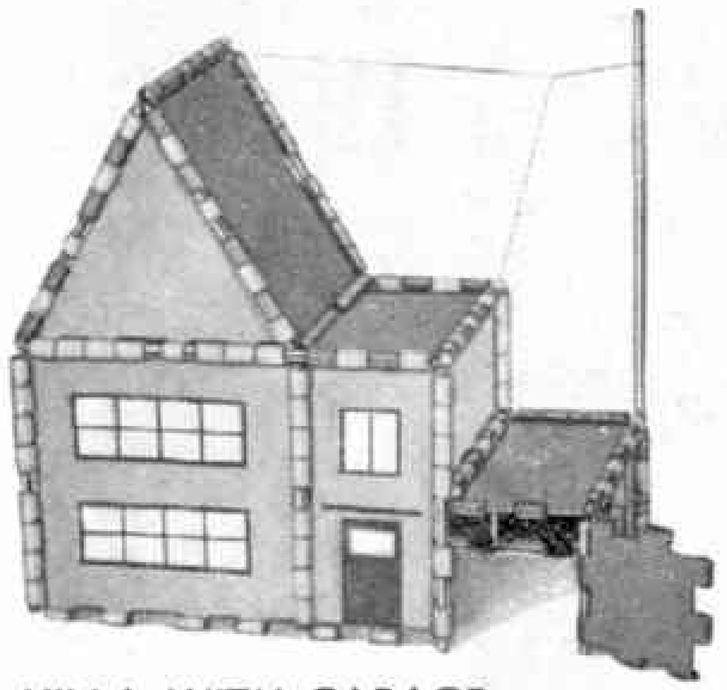

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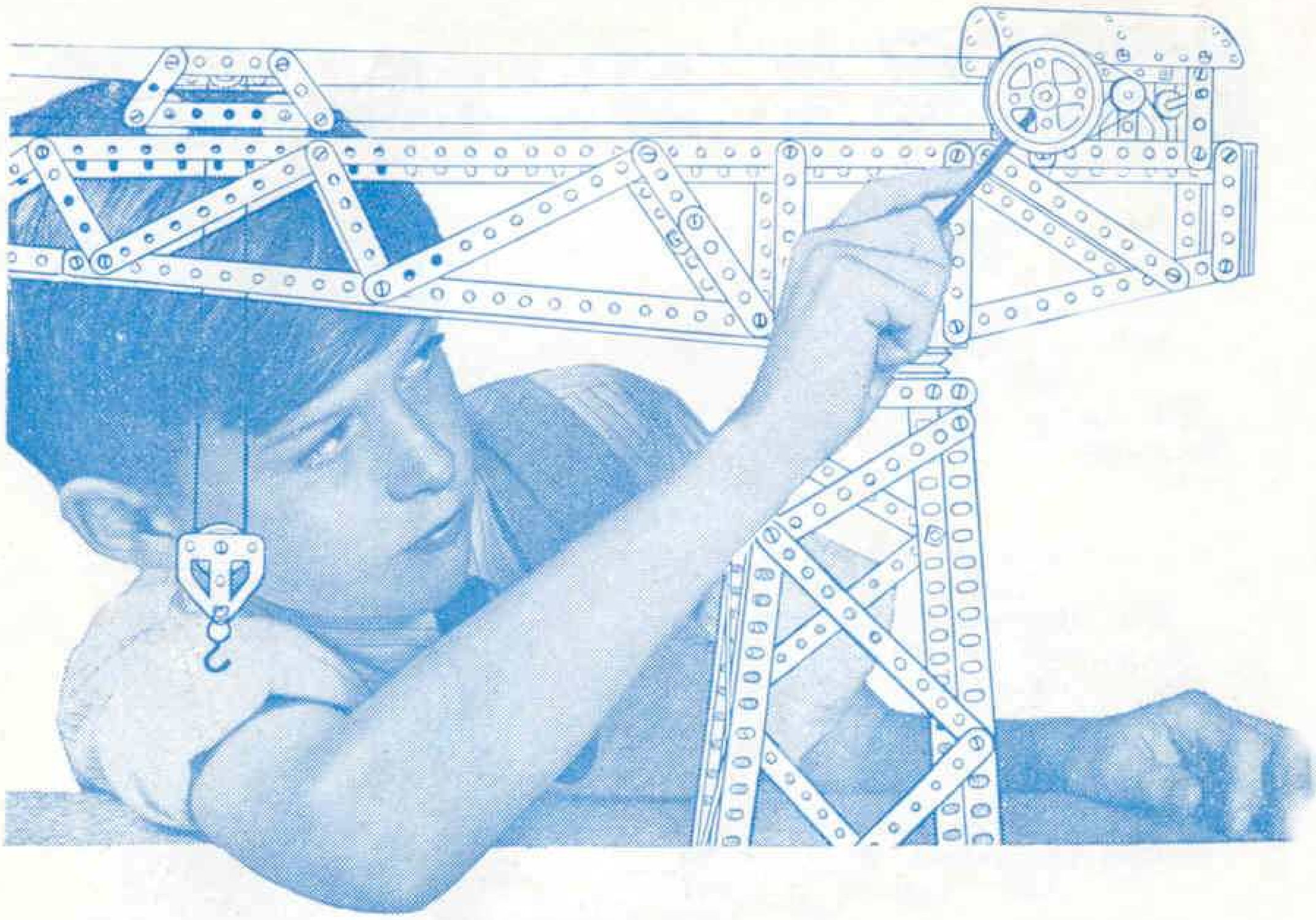

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